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1961

PETROLEUM WEEK

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How will Kennedy's program affect oil? 11

Exempt imports to hit 357,000 b/d 14

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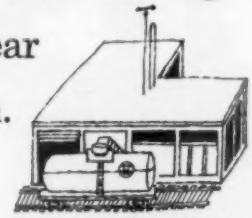

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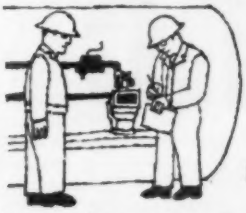

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INSIDE *Slant*

NEW RECRUITING TWIST

The 1961 graduates of the Harvard Business School are putting a new twist on job-seeking this year.

Instead of waiting for recruiters to come to their campus, the more than 200 graduates are sending representatives throughout the country to let smaller businesses know they are interested in working for them.

The recruiting of employers is a student-initiated program. Elected representatives of groups of approximately 30 students interested in various areas of the country will travel to those areas.

Contacts will be made with business clubs, bankers, chambers of commerce, Harvard alumni clubs, and small businesses directly.

The expenses of the student endeavor are defrayed by a contribution of $25 by each interested student. Additional funds are supplied by the Harvard Business School.

Many of the graduates prefer the opportunities for personal growth in small and medium-sized businesses to the security of the large corporations.

LeRoy Menzing
EDITOR

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Views That Make News

Dear Sir:

Your recent editorial, "Let's See Ourselves As Others See Us" (PW —Dec.16'60,p56), and many before it, have contained advice to the oil industry on improving public relations. Nevertheless, one particular piece of advice seems to have been overlooked; that is, doing something about the business of bilking heating oil consumers by false meter readings.

Though this may not be common, and doubtless occurs only at the lowest levels, it receives considerable publicity, and if there has been any publicity about the people involved going to jail for it, I haven't seen it.

Anyone considering putting in or even retaining oil heating may well ponder the fact that if he buys gas for heating he has a public service commission to look after him and see that his meter is tested regularly, and that the Btu. content of the gas is maintained. If he buys oil, he may be left wondering whether he has really bought oil or just air blown through the meter on the truck.

If the industry cannot devise, put in service promptly, and publicize a fraud-proof meter for oil trucks, it might well distribute free dip sticks to all the customers just to encourage honesty.

JOHN FOUNTAIN
Riverside, Conn.

Dear Sir:

We would like to further clarify our views on the "prudent operator" law as to secondary oil recovery methods:

Usually we think waterflooding of the oil-bearing sands as being rather large projects, involving hundreds or even thousands of acres each. This is probably justified as to large unbroken zones or sands, or where a big operator who can manage the necessary finances figures he can do the job more economically on the larger scale.

However, this should not discourage the consideration of waterfloods by smaller operators in every instance. We know of a successful waterflood nearby being conducted by an operator on just 40 acres. The lease covers only 80 acres. This waterflood was rather forced by an adjoining waterflood, but it demonstrates that some such waterfloods can at times be economically operated on rather small tracts. . . .

Apparently so many law authors and even lease operators have been saying and repeating in substance over the years what "primary" oil production operations mean, and what "secondary" oil production operations mean, that we have accepted these terms as proper without thinking.

They have said in substance that "primary" operations is what the operator does first or primarily, and that it means mostly the drilling of oil wells or the drilling of wells with the hope of pumping and producing oil therefrom, and that this could go on and on over the entire lease until all possible well locations are drilled, at least as to all the known or possible oil bearing sands or zones.

Then they have gone on to say that "secondary" operations is what the operator does to further produce after the "primary" operations have been tried and exhausted in substance.

Frankly, we do not see the importance or necessity of having these divisions of "primary" and "secondary" operations. To us, this division just confuses the situation.

It is not so important to know what methods the operator used. . . . The important thing to know is whether or not he was prudent and diligent in doing what he did in whatever order he used the various methods employed as to the particular lease involved.

An exchange of views might shed further light on the points covered.

JOHN W. PORTER, JR.
Porter & Porter
Muskogee, Okla.

"There are a number of favorable factors at work for the instrument industry. Capital spending plans for new plants and equipment and for modernizing existing facilities are down only sightly from 1960, and may be revised upward before the end of the year to the point where such outlays may approach record peaks."

—JAMES S. LOCKE
Vice-president
Minneapolis-Honeywell Regulator Co.

PETROLEUM WEEK will publish reader comments each week. Address letters to LeRoy Menzing, Editor, PETROLEUM WEEK, 330 W. 42nd St., New York 36, N. Y.

60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

January 6, 1961

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There may be some surprises in Washington as the incoming Kennedy Administration forms its petroleum policies. Percentage depletion, natural gas, and other oil matters may face rough times in Congress as the Kennedy team seeks to fire up the economy and expand U.S. leadership abroad. . . . p. 11

•

Texas tempers are rising over the issue of small-tract drilling—so don't be surprised if it turns into a battle royal. And it could be that the legislature will be prodded into considering a statute. . . . p. 28

•

Venezuela's year-end report is on the bleak side. About the only bright spot is a slight gain in crude production. Virtually everything else is down, as had been expected. . . . p. 40

•

Cautious optimism is the keynote for '61 as far as contract drillers and operators are concerned. A Petroleum Week survey indicates, however, that geologists will continue to have tough sledding. . . . p. 22

•

Two factors prompted Kuwait to award its prize offshore concession to Royal Dutch Shell: First, Shell's worldwide marketing facilities, and second, the fact that Shell is the only international major that is actually "short" of Middle East crude. . . . p. 16

•

Operations research is taking on added importance in the refining phase of the industry. It doesn't supplant managerial decisions—but it does give management sounder bases for making decisions. . . . p. 32

•

Major pipeline companies feel that 1961 will be a year of refinement and adaptation rather than bold innovation. Greater use of precoated pipe and polyethylene tape is anticipated in the battle against corrosion. . . . p. 38

•

Western Nebraska could be the hottest area in the Rocky Mountain area this year. Drilling is running at a near-record pace now. . . . p. 26

•

Oil marketers in Europe's Common Market countries may have to publish price schedules and stick to them. That's one of the proposals in an emergency program that's to be considered next week by the Council of Ministers. . . . p. 40

•

Propane, as a bus fuel, has been given a big plug by a business advisory firm. Stress was laid upon the near-term price outlook, and the favorable maintenance and operating characteristics. . . . p. 44

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

January 6, 1961

Spot distillate prices advanced on the Gulf Coast this week by 0.25¢ a gal., the second increase of the season. The previous advance, which came early in December, also was 0.25¢ a gal. The move was dictated by the sharply improved demand for heating oils. A continuation of the present cold wave over most of the nation could bring another price boost in the primary wholesale markets before the end of January. The new Gulf Coast low cargo price of No. 2 oil is 8.75¢ a gal. While this is 0.375¢ above the year-ago price, it is still 0.50¢ a gal. below the price of early January, 1959.

The advance on the Gulf was preceded by an increase of 0.3¢ to 0.5¢ a gal. for distillates along the eastern seaboard. That hike was initiated by Humble Oil & Refining Co. through its Esso Standard, Eastern region.

Two downward adjustments were made for crude prices this week. Ashland Oil & Refining Co. trimmed 5¢ from its flat postings in the Illinois Basin and eastern Kentucky, to $3 and $2.87 a bbl., respectively. The lower prices match those of other buyers. Mobil Oil Co. opened its gravity differential to 3¢ a bbl. from 2¢ for Oklahoma sweet oil below 36-gravity, in line with other buyers.

•

Crude production in Utah's Lisbon field is being curtailed temporarily, instead of being shut down altogether. That's the decision of the Utah Oil & Gas Conservation Commission, which took a middle-ground approach to the problem (PW—Dec.23'60,p.18). The curtailment, effective Jan. 1, limits output of existing wells to 150 b/d, and restricts gas flaring to 300,000 cf/d. For new wells, a total of 30,000 bbl. and 60-million cu. ft. of gas, whichever occurs first, can be produced before the 150 b/d restriction is imposed. In no case, however, can the initial 30,000-bbl. allowance be produced faster than 500 b/d. The agency bypassed the correlative-rights issue for the moment, but provided operators with a pattern for agreement on unitization.

•

The 12 companies convicted in the South Bend (Ind.) "price-fixing" trial have been given until Feb. 3 to file briefs for a new trial. A U.S. district court jury, after 62 hours of deliberation, upheld the Justice Dept.'s contention that the defendants violated the Sherman Antitrust Act by conspiring to raise gasoline pump prices on May 1, 1957, after a two-month disturbance. Convicted companies were Ohio Oil, Indiana Standard, Mobil, Gulf, Shell, Cities Service, Phillips, Texaco, Central West, Hudson, Pacer, and Tornado. A 13th defendant, Sun, was acquitted on a directed verdict in mid-December.

•

Two major petrochemical plants are scheduled for the Texas Gulf Coast in 1962. Tennessee Gas Transmission Co. is planning an acetylene plant of 100-million lb. annual capacity, and a conversion unit to make vinyl chloride monomer, along the Houston Ship Channel. Cary Chemicals, Inc., will use the output in production of polyvinyl chloride plastics.

Monsanto Chemical Co. will build a 500-million-lb.-a-year ethylene plant near Alvin. The output of ethylene, benzene (42-million gal.), and naphthalene (50-million lb.) will be used in other Monsanto plants.

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3 *Rides drivers through with less fatigue—for tighter schedules.* Wait till you see how Chevy front wheel action works to eliminate tiring shimmy and steering-wheel fight. It means that the man at the controls can stay there longer with less fatigue—stay on schedule and do a bigger day's work. (Another reason you can look for faster schedules is that Chevy's bump-beating wheel action allows faster safe speeds on rough roads.)

That gives you an idea of how Chevy Independent Front Suspension works to move you ahead in the money-making department. And it's available in 165 Chevrolet models for '61, from new Corvair 95's to 36,000-lb. GVW tandems. Check it out with a demonstration ride at your Chevrolet dealer's, sometime soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

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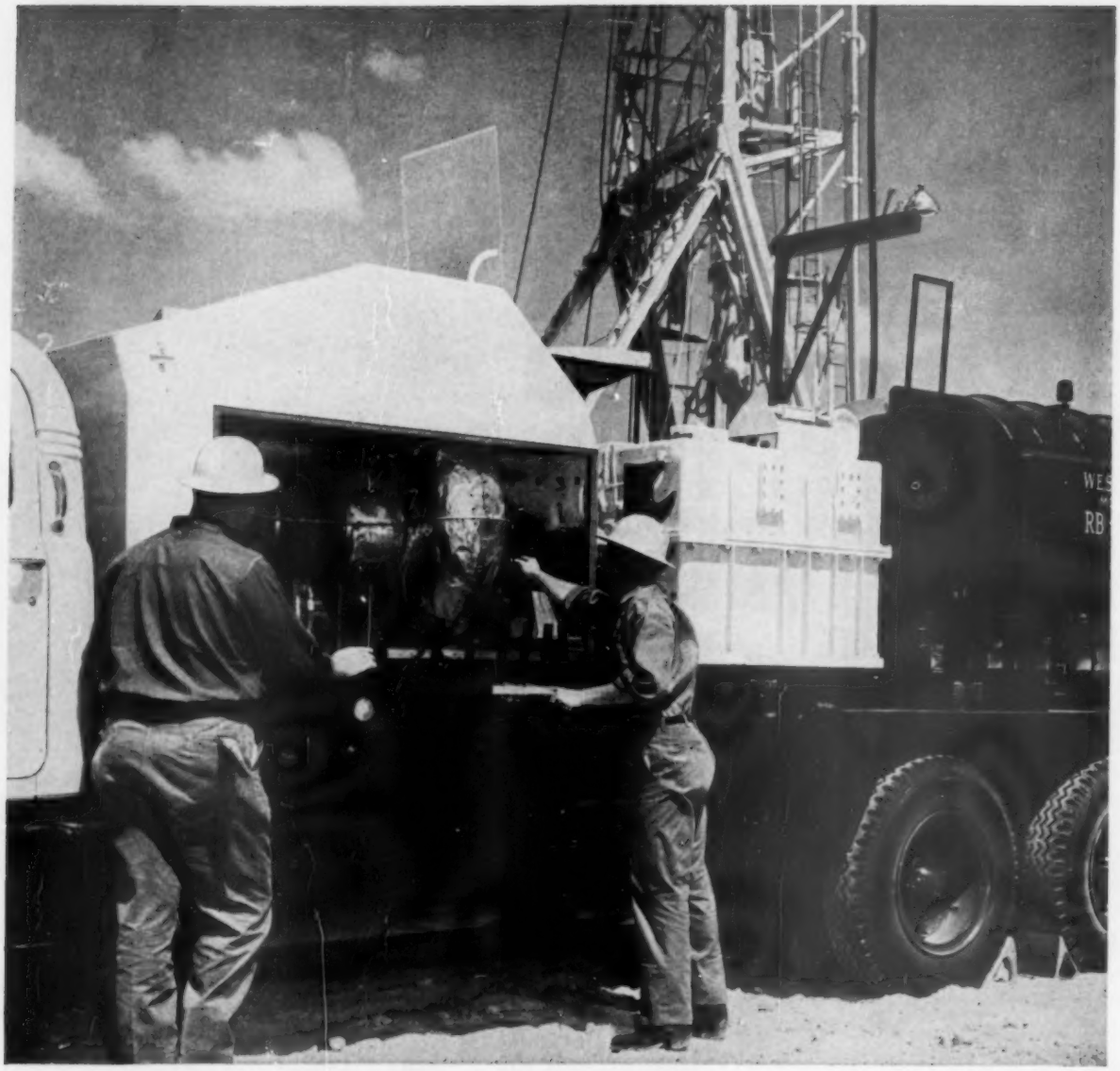

Solar gas turbine stimulates production of oil and gas wells

OIL FRACTURING OPERATIONS — used to stimulate production of oil and gas wells — must take place at the well site. This means that fracturing and acidizing pumping units must be lightweight and mobile — yet provide in excess of 1000 hydraulic horsepower for most operations.

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Many Oil Issues Hang in the Balance

The Kennedy Administration's petroleum policies will be formed against a backdrop of broad national and international goals. This could mean trouble for oil, and might produce some surprising tangents, too.

President-elect John F. Kennedy, his cabinet, and his advisors are pledged to work toward two major objectives:

- Increased U.S. world leadership, particularly in underdeveloped and uncommitted countries.
- A dynamic U.S. economy capable of supporting such a world role, and of providing for social and public gains at home.

Kennedy's plans can be translated into prime problems of taxation and trade—particularly percentage depletion and imports.

A new trade policy is not likely to be shaped before 1962, when the Reciprocal Trade Agreements Act goes before Congress for extension (PW—Aug.19'60,p19).

But tax troubles will be more immediate.

The Kennedy Administration will take early steps to stimulate the economy, and oil and gas depletion are sure to come under sharp fire when tax revisions are considered.

The 27.5% depletion rate won't be the only oil and gas tax provision to be attacked as a "loophole," however. Intangible drilling expenses will get a going-over too.

One of Kennedy's top advisors is a strong critic of depletion, and that spells trouble right away.

Walter W. Heller, a University of Minnesota economist, will head the Council of Economic Advisors.

Heller will have the President's ear, and will be able to push some of the ideas he has voiced in the past.

In 1959, for example, he told the House Ways & Means Committee that the tax laws now "confer tax advantages on a particular type of activity or form of organization" but "can find little or no foundation in present-day national economic, political, and military policies."

"Preferential tax treatment for oil, gas, and a host of other minerals," Heller continued, "has lost most of its military rationale, not only because we are not at war, but because of vast changes in military technology.

"Oil gluts . . . merely reinforce this point."

There may be some surprises in what Lyndon B. Johnson does as Vice-President, particularly where percentage depletion is concerned.

Technically, Johnson and Douglas Dillon, as Secretary of the Treasury, are expected to be restraining influences in the Administration on tax matters.

Yet many people in Washington believe that Johnson will move toward the "liberal" camp in hopes of a presidential nomination in 1968. Any strong defense of oil and gas depletion might endanger such an aspiration.

Thus, many observers have more than an academic interest in what he will do in his new role as Vice-President, and presiding officer in the Senate.

It's conceivable, too, that President-elect Kennedy may shun some party

stalwarts and rely on others like Sen. Paul Douglas (D., Ill.) in the Senate.

Sens. Harry Byrd (D., Va.) and Robert Kerr (D., Okla.), for example, may be bypassed.

Byrd failed to endorse a presidential candidate during the recent campaign —a failure widely interpreted to mean rejection of Kennedy.

Kerr, concerned mainly with his own reelection, paid only lip service to the Kennedy campaign in Oklahoma.

Both are key members of the Senate Finance Committee, but Washington observers think Kennedy might look to such men as Sen. Douglas for action on his program.

This would mean double trouble, for Sen. Douglas is a bitter critic of the petroleum industry. He is a strong foe not only of percentage depletion, but also of natural gas legislation being sought by independent producers.

Depletion will have two big advantages: votes in Congress, and the threat of a depressed industry adding to domestic economic woes.

If the Kennedy Administration decides to make an all-out effort to cut depletion, however, the votes will be decimated, and the depression argument weighed in light of the nation's over-all economic welfare.

Although Congress won't work on a trade bill until 1962, some of the groundwork will be laid this year. Restriction of oil imports will get a long, hard look from the Administration.

Kennedy generally leans toward freer world trade and dislikes barriers.

But he is concerned with the imbalance of payments, promoted by imports, and the sluggish U.S. economy accompanied by high unemployment.

He will measure these economic problems against the primary goal of his Administration, international leadership.

Although most oil-producing countries are not among the underdeveloped areas Kennedy worries about most, he nevertheless wants to prevent any drift of Arab countries and Venezuela toward Soviet influence. Eased restrictions on oil imports could conceivably result from pressures in these areas.

The incoming Secretary of the Interior, Stewart Udall, is expected to take a middle-road position on imports until Kennedy policies are shaped.

Udall has no strong views on the oil controversy, but will vigorously carry out any policy Kennedy sets.

Some Kennedy aides are talking up commodity agreements as part of a revised trade program.

Fully blossomed, such a program would mean bilateral or multilateral agreements with source countries—perhaps including oil-producing areas —in lieu of present restrictions on lead and zinc and oil, for example.

Congress, meanwhile, has several issues on its immediate agenda that will have direct and indirect effects on the petroleum industry.

Kennedy already has conferred with legislative leaders on an early program that includes a higher minimum wage, and aid for depressed areas—notably coal-producing regions.

Kennedy will look to Sen. Mike Mansfield (D., Mont.) and House Speaker Sam Rayburn (D., Tex.) to usher his program through Congress.

House and Senate leaders will be under a traditional requirement to press for the President's program, even if they personally disagree with some aspects of it.

Kennedy is not planning on a "100 days" crash program similar to that of the early New Deal. But he will try to take advantage of the "honeymoon" period a new President gets.

A higher minimum wage, with increased coverage of employees, is almost certain to be passed quickly.

Both the House and the Senate have held extensive hearings on the wage legislation, which failed last year, and will be able to get by with brief debate on a new bill.

Kennedy prefers a $1.25 minimum over the next several years, but would settle for a slightly lower figure, if necessary.

He will plump for wider coverage, too. His 1960 bill would have placed many service station employees under minimum pay requirements.

Congress will be inclined to ignore natural gas legislation once again this year.

Even if the gas industry bands together and presents unified support for a particular bill, the measure still would face an uphill fight.

But the likelihood of industry agreement on a bill isn't very bright at this time (PW—Dec.30'60,p17).

Congress and the Administration appear willing to await the result of court appeals on the Federal Power Commission's new area-pricing policy.

There is some sentiment, however, for enactment of an amendment to the Natural Gas Act to write area-pricing into law if it proves effective.

Congress will look to Kennedy for leadership on the question of a national fuels policy, but the recommendations of his regulatory advisor, James M. Landis, are expected to carry much weight.

Landis, in a lengthy report which scored the regulatory agencies, noted that "energy is another area where interaction is essential, and substantially none exists." He recommended "coordination both as to utilization and conservation."

In more concise words, this means that he favors a national fuels policy.

Landis' proposals for a White House "czar" to oversee the regulatory agencies and interpret Administration policies undoubtedly will stir up opposition in Congress.

His recommendations on the Federal Power Commission, which he lambasted as a dismal failure, included one urging expansion of the membership to seven to help clear up the enormous backlog that has piled up.

The oil industry may get better treatment from Kennedy than from Eisenhower on one problem: taxes on motor fuels for highway construction.

Kennedy may try to avoid an additional levy on motor fuels, including gasoline, to finance the interstate highway network. He is expected, however, to seek renewal of the 1¢-per-gal. increase scheduled to expire July 1.

The new Administration will have several choices to make on highway construction. The first: whether to keep the program on its present schedule or to stretch it over additional years. If the decision is made to keep it on schedule—as expected—then a choice must be made between new taxation or deficit financing.

Kennedy wants to see reports by the Commerce Dept.—due this month—on cost estimates and cost allocations, before making these decisions.

In the Kennedy Cabinet, one of the most-watched members will be brother Robert F. Kennedy, the Attorney General-designate.

Washington observers generally agree that the Democrats will be pressed to beat the antitrust record of the outgoing Administration.

But there are some thoughts that "Bobby" might prove surprisingly effective and strong.

Robert Kennedy is characterized as a believer in rigid antitrust enforcement, with a distaste for consent-decree settlements.

Consent decrees have been used frequently in oil industry cases. If Robert Kennedy wants to avoid this settlement route, more oil antitrust cases will go to trial than in past years.

The new Attorney General also is expected to emphasize price-fixing cases, particularly because of the President-elect's problem of keeping inflation in bounds while trying to stimulate the economy.

Industry Finds It Can Operate With Lower Crude Inventories

The oil industry is learning one important lesson in economy: It can get along with a lot less crude in inventory than was once thought necessary for operations.

Five years ago, refinery managers would have contracted severe cases of jitters if crude stocks had declined to the levels that they have maintained through most of 1960.

Some processors still don't like to "run off the bottom of our tanks," as some put it. But they are finding that they can get along with less crude in storage.

Generally, companies in the Southwest are operating with crude stocks around 20% below five years ago.

There are wide variations among companies, but for the most part they've trimmed the inventories they carry from 5% to 30%.

One company slashed its crude inventory 50% between 1957 and 1960, a cut that was due, in part, to the disposal of some of its transportation facilities.

The decision to learn to operate on less crude inventory was forced on many companies—particularly Texas Gulf refiners—by the prolonged period of low allowables.

As one company spokesman says: "One thing the low allowables taught us is that we can operate tank farms along our pipelines at lower levels than we thought we could."

Another company official comments: "Until a few years ago we were ultraconservative. We wanted to have a lot of crude on hand.

"If we had a break in one of our major pipelines we might be in trouble. But, with money as tight as it is today, and interest rates as high as they are, we're willing to take the gamble."

The ability of most companies to operate with less crude is due to automation all the way from the refinery back to the lease, greatly reducing the need for large stocks.

As one example of reductions in lease storage, Honolulu Oil Corp. automated four lease batteries this year and reduced its storage by 73%.

Prior to this automation, the company had 95 storage tanks at four locations. They were consolidated into central batteries at each location, reducing its inventories from 14,232 bbl. to an average of 3,850 bbl.

The trend to more automated, closed pipeline systems has also resulted in considerable reductions in inventories.

And because of the greater dependability of pipeline operation, many tank farms that were once necessary can now be bypassed.

Some companies report that they have stopped batching as many grades of crude as in the past, which helps to eliminate the need for a lot of extra storage along the line to handle the separate grades.

"At one time we were capable of taking crude in nothing less than 200,000-bbl. batches," one company official notes. "Today, with our efficient, streamlined operation, we can take 50,000-bbl. slugs."

Mohole Test To Start Offshore

Experimental drilling to test techniques and equipment for Project Mohole—an attempt to drill through the earth's crust under the ocean—will get under way by the end of next month or early March.

This was disclosed at a seminar on the project, at the American Assn. for the Advancement of Science meeting in New York last week.

A test site for the experimental drilling has been selected 40 mi. east of Guadalupe Island, off the coast of Mexico, in 12,000 ft. of water.

The drilling is being carried out under the joint auspices of a committee of the National Academy of Sciences and the National Research Council, with the support of the National Science Foundation.

A drilling contract has been awarded to Global Marine Exploration Co., of Los Angeles. The $735,750 contract calls for modification of the company's 260-ft drilling vessel, CUSS I, and use of the ship throughout drilling, which is expected to last a month.

If the first test hole is drilled successfully, three other holes will be drilled.

The first is designed to find out if a hole can be drilled in 12,000 ft. of water. There will be no coring, only a caliper log to tell how much surface pipe is needed for the second hole. The second test is slated to take cores through soft sediments; the third will be a logging hole (to be drilled as deep as one bit will go); the fourth will concentrate on taking core samples.

No casing will be used, and all holes will be drilled by standard rotary methods.

The unmoored drilling ship will be directed in water by sonar from buoys that encircle it, backed up by a secondary radar system. Four large outboard motors, one on each quarter of the vessel, will hold it in position.

Three Firms Make Corporate Changes

Acquisitions, mergers, and corporate streamlining continue to pace the news in the industry.

At the end of the year, Socony Mobil Oil Co., formally announced the purchase of the assets of Anchor Petroleum Co., Tulsa, a wholesaler of liquefied petroleum gases.

Mobil Oil Co., as previously reported by PETROLEUM WEEK (PW—Dec.9'60,p6), will operate the new properties. W. A. Baden, formerly president of Anchor, will join Mobil in a consulting capacity.

As part of its purchase of Anchor Petroleum, Mobil Oil acquired the stock of Petrolane Gas Co., a wholly owned subsidiary of Anchor.

Petrolane is a retail distributor of LPG in Louisiana, Mississippi, Alabama, and Florida. It will continue as a separate company.

"Purchase of Anchor's assets will strengthen Mobil in areas where the company previously has not been prominent in the sale of LPG," says Robert F. Neal, manager of Mobil's LPG department.

Halliburton Co., Duncan, Okla., has merged Welex, Inc., into the parent company.

Welex, which has been owned by Halliburton since 1957, has operated as an independently managed subsidiary. It will now be known as Welex, a division of Halliburton. Turner Armstrong, formerly vice-president of Welex, has been named general manager of the division.

Cities Service Co. has created Cities Service Petroleum Co. to take over the operations of Cities Service Oil Co. (Del.).

It will handle all domestic and Canadian exploration and production activities (PW—Dec.30'60,p19).

Imports in the First Half

Import Quota Cuts Bring More Exempt Oil

(Barrels daily)

	1959 First Half†	1959 Second Half	1960 First Half	1960 Second Half	1961 First Half
EAST OF ROCKIES					
Crude and Unfinished	759,000	682,707	718,218	704,328	689,717
Light Products	221,000	76,631	76,631	76,634	76,634
Residual Fuel	604,000	363,433	540,000	354,000	530,000*
Total Allocated	**1,584,000**	**1,122,771**	**1,334,849**	**1,134,962**	**1,296,351**
Exempt Canadian	.....	57,000	66,000	70,000	75,000
Bonded Residual	100,000	107,000	163,000	160,000	185,000
Bonded Distillates	.....	.....	23,000	21,000	25,000
Total East of Rockies	**1,684,000**	**1,286,771**	**1,586,849**	**1,385,962**	**1,581,351**
WEST COAST					
Crude and Unfinished	201,000	233,310	220,095	263,303	217,500
Resid, Light Products	21,000	10,619	6,753	10,619	10,679
Total Allocated	**222,000**	**243,929**	**226,848**	**273,922**	**228,179**
Exempt Canadian	.....	50,000	52,000	51,000	50,000
Bonded Resid, Dis.	.....	.....	6,000	6,000	22,000
Total West Coast	**222,000**	**293,929**	**284,848**	**330,922**	**300,179**
PUERTO RICO					
Crude and Unfinished	80,147	80,883	80,883	80,883	87,611
Residual Fuel	2,968	2,140	2,140	1,644	1,644
Light Products	611	354	354	354	354
Total Puerto Rico	**83,726**	**83,377**	**83,377**	**82,881**	**89,609**
TOTAL U.S. IMPORTS	**1,989,726**	**1,664,077**	**1,955,074**	**1,788,765**	**1,971,139**

†Includes voluntary and mandatory control periods. *Allocation for first quarter only.

Allocated and exempt petroleum imports will average 1,971,139 b/d in the first half of the year—the highest yet for a full six months under the mandatory control plan.

The total level now anticipated includes all imports into the continental U.S. and Puerto Rico.

The volume of crude and products expected to be imported in the first half of 1961 is just slightly below the average for the first half of 1959 (table, left), when mandatory controls replaced the voluntary control plan in mid-March, 1959.

Allocated imports for the next six months will be below the first half of 1960, but a continued growth in the volume of exempt crude and products imports accounts for the increase in the total.

Allocated imports of crude, unfinished oils, and products into the continental U.S. in the January-June period will average 1,524,530 b/d. An additional 89,609 b/d were assigned to Puerto Rico.

Allocations to the mainland in the first six months of 1960 averaged 1,561,697 b/d, plus 83,377 b/d for Puerto Rican importers.

Here Are the Company-by-Company Quotas

CRUDE AND UNFINISHED OIL

(Barrels Daily)

DISTRICTS I-IV

	Jan.-June, 1961	Old
Advance Refining	306	312
Allby Asphalt	319	343
Allied Materials	276	293
American Petrofina	3,760	3,930
Anchor Gasoline	115	119
Anderson-Pritchard	3,208	3,253
Anderson Refining	65	26
Arkansas Louisiana	207	230
Ashland Oil	11,967	12,254
Atlantic Refining	36,144	38,000
Atlas Processing	1,776	1,283
Bayon State Oil	96	117
Bell Oil & Gas	1,952	1,975
Berry Asphalt	289	301
Big West Oil	244	257
Bird & Son	726	541
Bryson Pipeline	79	77
Cactus Petroleum	271	283
Calumet Refining	210	216
Century Refining	312	351
Champlin Oil & Refining	2,907	2,989
Cities Service	20,016	21,040
Claiborne Gasoline	146	.....
Clark Oil & Refining	3,226	3,292
Colorado Interstate Gas	1,946	1,997
Continental Oil	13,549	14,142
Cooperative Refinery	3,571	3,736
Cosden Petroleum	3,815	4,086
Cracker Asphalt	132	133
Cross (Henry H.)	351	372
Crown Central	3,490	3,526
Danaho Refining	396	380
Debco Corp.	14	.....
Delhi-Taylor—Dallas	3,385	3,350
Delhi-Taylor—Houston	561	829
Diamond Asphalt	73	84
Distillate Products	35	.....
Dow Chemical	1,944	2,040
Eddy Refining	241	242
Elk Refining	510	513
El Paso Natural	2,196	2,139
Empire Petroleum	545	575
Empire State Oil	401	488
Evangeline Refining	104	119
Famariss Oil	161	165
Farmers Union	2,087	2,096
First City National (Houston)	4,521	.....
Frontier Refining	2,509	2,584
Gabriel Oil	1,800	1,895
Gladieux Oil	116	94
Great Northern	20,232	.....
Great Western	244	237
Gulf Oil	68,472	71,990
Hess	7,056	7,420
Howell Refining	479	479
Hunt Oil	549	647
Husky Oil	616	699
Ida Gasoline	41	30
Illinois Farm Supply	524	522
Indiana Farm Bureau	1,370	1,404
Ingram Oil	2,520	2,650
Jarvis	119	137
Jet Fuel Refinery	43	59
Kendall Refining	502	513
Kerr-McGee	4,149	4,290
Laketon Asphalt	361	337
Leonard Refineries	2,650	2,744
Macmillan Petroleum	409	421
Metropolitan Petroleum	117	120
Mid-America Refining	258	266
Midland Cooperatives	1,376	1,448
Monarch Refining	266	268
Monsanto Chemical	3,346	3,259
Murphy	3,096	3,260
Naph-Sol Refining	805	856
National Cooperative	3,067	3,083
Northwestern Refining	8,280	8,710
Ohio Oil	8,650	8,943
Oriental Refining	399	421
Osceola Refining	176	190
Pennsylvania Refining	128	134
Petroflex	64	50
Petroleum Refining	234	237
Petroleum Specialties	839	862
Phillips Petroleum	16,320	17,154
Plateau	72	25
Plymouth Oil	2,880	3,252
Pontico	1,652	.....
Pure Oil	13,067	13,389
Quaker State	924	997
R. J. Oil & Refining	394	399
Rado Refining	53	59
Rock Island Refining	1,748	1,647
Seminole Asphalt	192	201

Will Average 1,971,139 b/d

Exempt imports of Canadian crude and bonded residual and distillates are expected to reach a peak of 357,000 b/d in the first half, an increase of 47,000 b/d over 1960.

The largest increase in the exempt status is in bonded residual to be brought in by East Coast importers. Imports of bonded resid to the eastern seaboard are expected to average 185,000 b/d in the January-June period, up nearly 25,000 b/d over the 1960 average.

Imports of exempt Canadian crude into areas east of the Rockies will take a sizable jump, also, increasing to an estimated average of 75,000 b/d in the coming six months.

The most significant gain will be in the Toledo area, where several companies are turning to Canadian crude to replace domestic oil.

Interior Dept. officials took note of the increase in exempt imports by deducting 210,000 b/d from the Bureau of Mines' forecast of demand for the areas east of the Rockies for the first half of 1961.

The ceiling on controlled imports, other than residual fuel oil, is pegged at 9% of the Bureau's forecast of total demand in Districts I-IV. In its forecast for total demand for the whole country, its estimate for the areas east of the Rockies was 8,941,000 b/d.

Interior officials reduced that forecast to 8,731,000 b/d to allow for imports of exempt crude and products by oil companies, and to allow for the Defense Dept.'s import and re-export of residual fuel and jet fuel purchased offshore.

The other deduction by Interior officials was one of 19,260 b/d from the District I-IV allocation to cover an overestimate of total demand for the area in the first half of 1960.

A deduction of 11,703 b/d was made in the West Coast allocation to cover an overestimate of shipments from District V into areas east of the Rockies in the first six months of last year.

Some oil economists are concerned over what they consider a tight import allocation for the West Coast.

They say that the bureau's 280,000 b/d estimate of the difference between local supply and demand in the area is not sufficient. They estimate that, even though exempt imports from Canada will average higher than the 40,000 b/d allowed for by Interior officials, West Coast refiners will be short of crude in the first half of the year.

Speculation is that such a shortage will have to be covered by more Canadian oil or by a set-up in the movement of crude from the Four Corners area to the West Coast.

The Import Bank

The First City National Bank of Houston has qualified for an import quota due to its position as trustee of the Gulf Oil Foundation.

The crude quota assigned the bank had been held by Pontiac Refining Corp.

Income from Pontiac's operations has been acquired by Gulf Oil Corp., which has assigned it to the newly formed Gulf Oil Foundation. The latter will administer Gulf's contributions to schools, colleges, hospitals, and other charitable institutions.

The Oil Import Administration ruled that the bank, as trustee, became an operator. It received a quota of 4,521 b/d.

	Jan.-June, 1961	Old
Shamrock Oil	2,433	2,422
Shell	22,568	23,105
Signal Oil	12,600	13,249
Sinclair Oil	38,160	40,120
Sioux Oil	556	577
Skelly Oil	4,821	4,839
Socony Mobil	41,184	43,300
Sonneborn Sons	176	168
South Hampton	137	48
Southland	2,283	2,320
South Penn Oil	1,137	1,151
Southwest Gas	427	.....
Southwestern Oil & Refining	3,646	3,476
Standard (Calif.)	40,968	43,070
Standard (Ind.)	31,606	30,745
Standard (N. J.)	44,208	46,480
Standard (Ohio)	11,404	11,723
Sun Oil	30,960	32,550
Sunray Mid-Continent	12,002	12,453
Tennessee Gas	3,630	3,577
Texaco	33,408	35,120
Texas Asphalt	1,440	1,515
Texas City Refining	2,995	3,043
Texas Eastern	1,807	1,834
Texas Gas	805	810
Texstar	201	200
Three Rivers Refinery	104	114
Tidewater Oil	21,024	22,100
Uinta Oil Refining	144	137
Union Oil	376	376
United Refining	2,160	2,170
Vickers Petroleum	1,535	1,593
Vulcan Asphalt	181	185
Warrior Asphalt	135	130
Waskom Natural	185	171
Western Natural	1,607	1,544

	Jan.-June, 1961	Old
PUERTO RICO		
Westland Oil	198	193
Wickett Refining	218	237
Wolf's Head Oil	211	227
Wyandotte Chemicals	268	285
Commonwealth Oil	67,144	61,944
Caribe Nitrogen	736	736
Pontico	19,731	18,203
DISTRICT V		
Caminol	2,542	2,240
Century Oil	1,598	1,830
Douglas Oil	6,612	7,157
Edgington Oil	3,018	3,306
Envoy Petroleum	798	960
Fletcher Oil	3,458	4,160
Golden Bear Oil	1,891	1,797
Golden Eagle Refining	2,663	2,899
Gulf Oil	11,305	.....
Lunday-Thagard Oil	398	457
Macmillan Petroleum	2,794	2,892
Manespo Refining	931	1,120
Mohawk Petroleum	3,629	3,951
Newhall Refining	1,165	1,008
Oxnard Oil & Refining	274	273
Palomar Oil & Refining	388	446
Powerine Oil	5,046	5,225
Richfield Oil	22,886	27,785
Shell	21,906	26,789
Signal Oil	4,190	5,040
Socal Oil & Refining	966	1,009
Socony Mobil	16,071	19,928
Standard (Calif.)	34,491	44,515
Sunland Refining	1,530	1,840
Texaco	14,885	18,123
Tidewater Oil	23,608	28,400
Union Oil	23,883	30,553

LIGHT PRODUCTS

DISTRICTS I-IV	Jan.-June, 1961	Old
Ballard Oil	1,165	1,165
Blanchet & Fils	3	3
Castrol Oils	2	2
Gulf Oil	2,723	2,723
Hess	3,234	3,234
Irving Pulp & Paper	3.32	.....
Leonhardt Associates	0.20	0.20
U.S. MPSA	30,554	30,554
Pittston	5,100	5,100
Pure Oil	5.50	5.50
Robinson Lumber	1.25	1.25
Royal Petroleum	1,476	1,476
Shell	9,812	9,812
Socony Mobil	25	25
Standard (Calif.)	7,284	7,284
Standard (N. J.)	13,590	13,590
Sun Oil	604	604
Texaco	1,052	1,052
DISTRICT V		
Alaska Propane	35	35
Fairbanks Plumbing	3.33	3.33
U.S. MPSA	3,876	3,876
Petrolane Gas Services	60	.....
Shell Companies	193	193
Standard (Calif.)	576	576
Suburban Gas	2.10	.....
Time Oil Co.	2,068	2,068
PUERTO RICO		
U.S. MPSA	152	152
Shell	57	57
Standard	104	104
Tropical Gas	41	41

Who Bid What in Kuwait—and Why Shell Won

KUWAIT—Kuwait's decision to award its prize offshore oil concession to the Royal Dutch Shell is a clear indication of the new, growing awareness in the Middle East of the importance of marketing.

Without any doubt, it was Shell's huge world-wide marketing facilities—and knowhow—that constituted its chief "sex appeal" to Kuwait.

It was this that tipped the scales to Shell—despite the fact that the company offered only the traditional 50-50 profit-sharing deal and only a 20% participation, in contrast to several attractive "baits" offered by other, smaller companies.

Two years ago, observers here note, Shell wouldn't have stood a ghost of a chance of winning a concession on these terms.

Earlier, the emphasis throughout the Middle East had been on new "extras" and "gimmicks" not contained in the traditional concessions, such as a direct break in the 50-50 formula (as the 57-43 split with the Japanese), "integration" (as emphasized by Saudi Arabia), or the so-called "75-25" deals in Iran.

There was interest then, too, in bringing in "newcomers," as well as new nationalities (e.g., the Japanese and Italians) to water down the role of the established international major companies.

But since then, two price cuts, plus the well-publicized difficulties of "newcomers" in Venezuela and North Africa in finding markets for their oil without sharp price cutting, have affected governmental attitudes here.

Here's how one top Kuwait government official explains the award to Shell:

"We decided that Shell (1) has as great an interest in maintaining a high posted price for crude as Kuwait does, (2) is large enough to be able to move our oil into its own established markets without having to resort to price cuts, and (3) because of its strong marketing position in the Eastern Hemisphere, would be in the best position to help our newly established Kuwait National Petroleum Co. get started in overseas refining and marketing.

"As you can see from looking at the other bids, some of them were very attractive in other ways. But none of them offered us the marketing possibilities, at high prices, that Shell did."

* * * *

In all, nine bids were received by Kuwait. One, from Signal Oil, was rejected outright. Kuwait officials report Signal offered to spend up to $10-million on exploration at its own risk. If oil was found, Signal was to recover all its expenses and then receive 20% of the oil, free of cost, as a "fee" for its production services and for marketing the government's 80% of production.

Kuwait objected to this type of deal because the government felt it amounted to only a "contracting service," and because Signal was in no position to find outlets for Kuwait's share except at heavy price discounts.

The other eight bidders were then called in for negotiations. Some had offered no participation for Kuwait. Others had put their profit-sharing terms on actual market realizations.

Kuwait made three points conditional for further negotiations: (1) all profit-sharing formulas to be based on posted prices; (2) participation to be provided for Kuwait; and (3) Kuwait to have the choice of taking its share of the production in cash or in oil.

All the companies revised their bids accordingly.

* * * *

The final offers were as follows:

(1) Cities Service: A 60-40 profit split in favor of the government, plus 10% participation in the producing company (to be paid for by Kuwait), a bonus of $1.5-million, and an annual rental. (Alternatively, Cities Service offered a 50-50 tax split plus 50% participation, but the first offer was considered better by Kuwait.)

(2) Atlantic Refining-Phillips-Pure Oil: A 57-43 profit split, plus 25% participation (to be paid for), a $1.5-million bonus on signature, and a $2-million bonus on discovery, no rental. (This was considered the best of three alternative offers submitted by this group.)

(3) Continental Oil: A 50-50 profit split, but with additional payments as production increased in the form of a percentage of income (up to a maximum of 8%), plus 20% "free" participation in the producing company, no bonus or rental.

(4) Pan American International: A 50-50 profit split, plus 50% participation (to be paid for), no bonus or rental.

(5) AGIP-ENI group: The same as Pan American, but with a $1.5-million annual rental.

(6) Japanese group: A 57-43 profit split, plus 20% participation (to be paid for), including an "integration" offer of a 20% share in transportation, refining, and other phases of operations. A small bonus and rental—but postponement of the start of any operations for two years.

(7) Jersey Standard-British Petroleum-Gulf Oil: A 50-50 profit split, plus 15% participation (to be paid for), with disposal of Kuwait's share of oil at not less than 90% of posted prices (if Kuwait wanted a higher participation, prices would have to be "discussed").

Kuwait, however, was to participate right from the beginning, including in exploration. In addition, operations were to be postponed for five years to train the staff of Kuwait National Petroleum Co. at BP's expense, in order to insure fully effective participation.

An annual rental of £3-million ($8.4-million) during the five-year waiting period, to be paid by KNPC in proportion, plus a £3-million annual rental thereafter until production, then an annual royalty of £3-million. No bonus, but in effect the annual rental during the initial five-year delay would amount to a bonus.

(8) Shell: A 50-50 profit split, plus 20% participation (to be paid for by Kuwait when commercial production found, including its pro-rata share of prediscovery costs), with disposal of Kuwait's share of the oil at not less than 90% of posted prices. Signatory bonus of £7-million ($19.6-million), plus £7-million at the end of the fourth year, and an additional £16-million in bonuses at certain levels of production, plus annual rentals (for fuller details, see this column in PETROLEUM WEEK, Dec. 23, 1960, page 15). Shell submitted four alternative offers, of which this was considered the best.

* * * *

Here's how Kuwaiti officials analyzed these bids (table shows the Government's analysis of how the eight bids compared in terms of the actual share of profits accruing to Kuwait):

• The offers of the various American independents and newcomers were rejected, despite the obvious attractiveness of some of the terms, largely because these companies were regarded as offering "relatively poor marketing prospects."

None of these companies has any large existing outlets of its own in the Eastern Hemisphere, and their U.S. outlets are limited by U.S. import restrictions, which are of unknown duration.

"If we gave the concession to any of those companies," says one top government official, "we knew we would have to accept the possibility of allowing discounting of prices in order to help them create new markets."

• The Italian AGIP-ENI group was turned down, even though it had some assured refining outlets in Italy and elsewhere, because it was a foreign-government-owned company "with extensive dealings with Soviet Russia."

Kuwait's decision was apparently influenced at least partly by the recent deal between ENI and Moscow for large-scale imports of Russian oil at very low prices in exchange for large-diameter Italian pipe.

ENI's pitch to Kuwait—as to other Arab countries—had been that the company wouldn't need to import

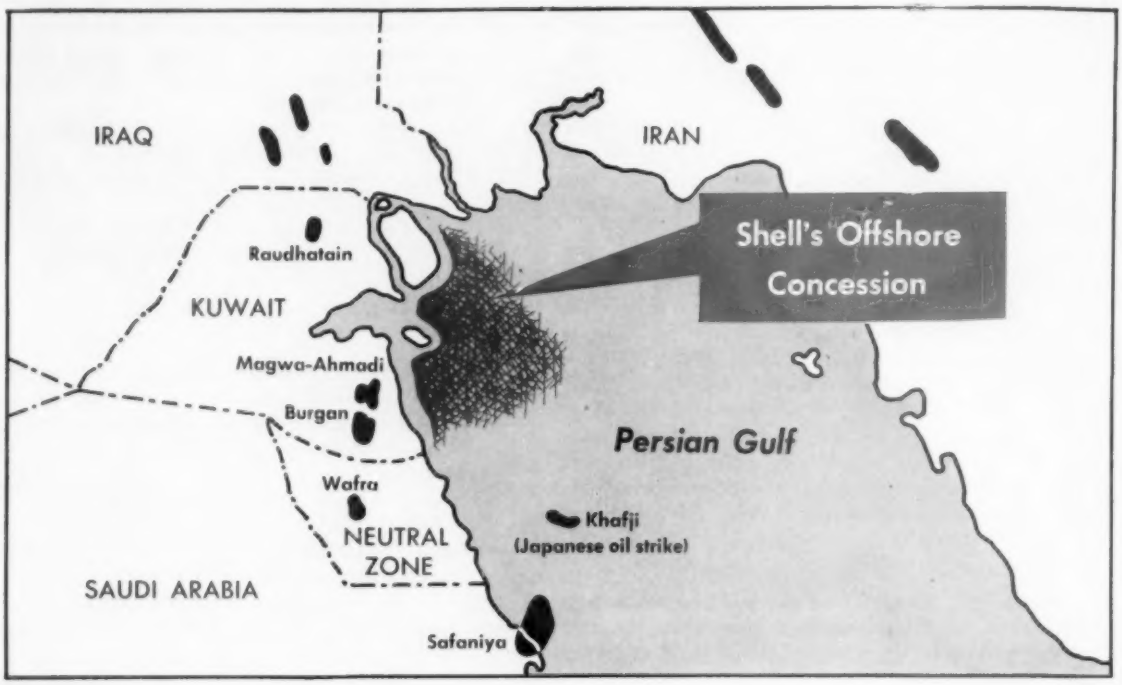
continued ▶

Kuwait's Analysis of Its Income Share Under Various Bids

Company	(A)† *Tax receipts —% of profit based on posted price*	(B) *After tax payments under (A), added participation in net profits based on realizations*	(C)* *(A) plus (B): % of total profit based on posted prices accruing to Kuwait*	(D)* *(A) plus (B): % of actual total net profit accruing to Kuwait*
AGIP	50%	50%	68.2%	78.9%
Atlantic-Phillips-Pure	57	25	63.7	73.8
Cities Service	60	10	62.6	72.5
Continental	50% plus up to 8% of gross sales, rising with production	20	up to 50,000 b/d: 57.3 at 200,000 b/d: 60.5 at 500,000 b/d: 63.8	66.3 70.1 73.9
Japanese	57	20	62.9	72.8
Pan American	50	50	68.2	78.9
Shell	50	20	57.3	66.3
Standard (NJ)-BP-Gulf	50	15	55.5	64.2

†Column (A) includes royalty, income tax, and make up tax payments above 50%.

*The estimates of profit shares in columns (C) and (D) are based on assumptions of posted price of $1.50 per bbl., realizations of $1.35, costs of 40¢ per bbl., with amortization of prediscovery costs ignored. Ignored also are the marketing prospects, and hence production potentials, of the different companies —an important factor, since, say, 55% of a large production potential would mean more revenue than, say, 68% of a small one.



Russian oil if it could get Middle East sources of its own (PW—Nov.11'60,p86).

But Kuwaiti officials drew a different conclusion "We figured," says one, "that if the Italian Government directs ENI to use Russian oil for barter or other reasons, ENI will do so—regardless of whether it has an Arab oil concession."

• **The Japanese group was turned down because Kuwait doubted its ability to handle two concessions at once**—as also indicated by the group's request for a two-year delay. (The membership of the Japanese group was not entirely clear, but consisted mostly of the same Japanese businessmen who won the Kuwait Neutral Zone offshore concession two years ago.)

Also, Kuwaiti officials pointed out, the Japanese group's current market prospects are limited to Japan, and their "internal financial ability is not regarded as too good."

* * * *

This left only the two major international bidders: the combined Jersey-BP-Gulf group, and Shell. Of the two, Kuwaiti officials felt, Shell offered greater new marketing prospects.

In the first place, it was felt that award of the concession to the BP and Gulf partners would largely displace existing Kuwait crude—since these two companies own the main onshore Kuwait concession, where they have already discovered huge reserves. Jersey Standard, while a large worldwide marketer, also has large Middle East oil sources of its own.

Shell, on the other hand, is the only large established international oil company that is actually "short" of Middle East crude, and is a crude buyer on balance. (Shell owns only a 14% share in the Iranian consortium and a 23.75% share of Iraq Petroleum Co.)

The company is currently purchasing around 500,000 b/d of Kuwait crude from Gulf, under a long-term contract.

"Shell assured us," explains a Kuwaiti official, "that it could use substantial additional volumes of Kuwait crude without cutting back on its Gulf purchase contract."

Two other factors also favored Shell, according to Kuwait officials. The government felt that a single company was "easier to deal with" than a group of companies. And Shell offered the government more attractive financial terms.

Shell, for example, accepted the full prediscovery risks, whereas the Jersey-BP-Gulf group wanted Kuwait to share these.

Moreover, Shell's "signatory" bonus, combined with its prediscovery rentals, guarantee Kuwait at least some income even if no oil is found. By contrast, the five-year delay under the offer by the Jersey group would have set back the financial benefits from this offer considerably.

What's New / IN THE INDUSTRY

Higher wages in the petroleum industry cannot be absorbed, but will have to be reflected in higher crude and product prices, according to Alvin C. Hope, president of the Independent Petroleum Assn. of America. He noted that while major product prices made a slight recovery in the last seven months of 1960 from the six-year low reached in May, prices are still below the 1957 levels. The average refinery price of the four principal products in 1960 of $3.96 a bbl., he said, compared with $4.24 a bbl. in 1957.

Crude prices failed to recover from depressed levels in 1960, and total income from crude sales was more than $560-million less than in 1957, the IPAA executive said. Oil industry earnings, he observed, now "at levels below the national industrial average, leave no other alternative" but to offset higher labor costs with higher crude and product prices. There is little hope, he added, of any substantial increase in drilling rates in 1961 from the approximately 46,750 completions in 1960—an eight-year low.

•

Sen. Thomas H. Kuchel (R., Calif.) isn't happy with the Defense Dept.'s stand on the use of foreign oil by the Navy. Sen. Kuchel says the Defense Dept.'s "attempted justification of foreign buying suggested that one purpose is to drive down the price of domestic oil." He says he is "unconvinced of the wisdom" of importing foreign oil for Navy use while the U.S. is "trying to safeguard dollar reserves, and the domestic producing industry is operating on a curtailed basis." The Californian also contends that, if the Navy feels U.S. prices are excessive, other steps might be taken to encourage more competitive bidding so that the domestic industry would be "kept alive and workers employed."

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American-flag tanker operators have been turned down in their fight for a fixed share of oil import cargoes. The Office of Civil & Defense Mobilization, after a year-long investigation, ruled that there is no justification for the operators' plea that national security is jeopardized. OCDM Director Leo Hoegh said tankers available to the U.S. are adequate to meet defense requirements for the present and the foreseeable future. In addition, he said, the operators' proposal would, if approved, add materially to the cost of imported oil, and would not be in the best interests of consumers or the government. U.S.-flag operators wanted 50% of the oil import cargoes. Their petition was filed by the Joint Committee for American Flag Tankers and the Committee of American Tanker Owners, Inc.

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Continental Oil Co. is switching more of its basic operations from Ponca City, Okla., to Houston. Staffs of four departments will relocate in the company's headquarters offices sometime this month. The departments are crude trading, manufacturing operations, product supply, and product distribution. Heads of the departments are: Frank E. Butterfield, crude trading; I. A. Harrisberger, manufacturing operations; Gordon H. Lovejoy, product supply; and M. A. Snodgrass, product distribution. This means that the pipeline department is about the only major department left in Ponca City, once the company's headquarters.

•

Rhode Island's Supreme Court held last week that the Tiverton town council must consider a building application of Rhode Island Refining Co. The company had been denied a permit to build 450,000 bbl. of storage capacity in the town. The court said the council had failed to give a "specific reason."

SAVE the BEAN
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With ordinary care, a single UNIBOLT Master Bean will last for the entire flowing life of a well. These beans are threaded to receive an inexpensive screw insert. The cutting action of sand-laden production is imposed on the expendable insert, not the master bean.

The inserts are not only inexpensive, they are easier to change than regular beans. Drilled in increments of 5% and 10% of well flow, as well as in increments of 1/64th inch, these inserts provide the versatile range of an adjustable choke with the fine accuracy of a positive orifice.

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
January 6, 1961

The Democratic-controlled 87th Congress got under way this week, and some members whose voting records don't favor petroleum are gaining power. Note the rise of Sen. Hubert Humphrey (D., Minn.). He is in line to be Senate majority whip. Humphrey has consistently voted to reduce the oil and gas depletion percentage. He is also a critic of gasoline pricing practices.

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Sen. William Proxmire (D. Wis.) is trying to get a job on the Senate Finance Committee.

Proxmire is probably the petroleum industry's biggest foe. He regularly authors tax amendments to cut the depletion percentage, and wants utility-type federal regulation of gas producers. The vacancy he is eyeing is that of Sen. Allan Frear (D., Del.) who was beaten for reelection.

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There will be opposition to Proxmire—from Virginia's Harry F. Byrd and like-minded fiscal conservatives. But Proxmire wants the job, and will work hard to get it.

The lineup of the Finance Committee, with Proxmire, would be less favorable to retention of the 27.5% depletion level. In addition to ranking members Byrd and Robert Kerr, of Oklahoma, other prodepletion Democrats are Sens. Russell Long (D., La.) and Clinton Anderson (D., N.M.).

The antidepletion bloc is led by Sen. Paul Douglas (D., Ill.), and includes Eugene McCarthy (D., Minn.) and frequently Albert Gore (D., Tenn.). The swing votes would be cast by Sens. George Smathers (D., Fla.), Herman E. Talmadge (D., Ga.), and Vance Hartke (D., Ind.).

The Republican members of the committee are split on depletion, too. Sen. John J. Williams (R., Del.), ranking GOP member, wants a sharp depletion cut to 15%, but he is balanced by Sen. Frank Carlson (R., Kan.).

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Sen. Clinton Anderson will take over the chairmanship of the Senate Interior Committee. Anderson might push some corrective measures to tighten oil and gas leasing regulations in line with an investigation he headed which uncovered "strawman" improprieties.

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Congress will push for a nuclear tanker program. Guessing is that it will approve a program based on government and industry partnership in building the tanker, instead of a government-owned prototype vessel. The government will likely pay the difference in cost between the nuclear and conventional propulsion plant. The Maritime Administration and private companies, Jersey Standard for one, are plugging hard to move ahead in the nuclear propulsion field for tankers.

The use of tankers to haul foreign-aid grain cargoes may come under congressional scrutiny, too. When Congress specified that 50% of foreign-aid cargoes must move in American-flag vessels, the intent primarily was to aid the tramp shipping industry. Now, the tramp operators claim, the tanker operators are taking more and more of the cargoes to help improve their own tight economic situation.

Crawler-wise "skinner" Rockets to Favor with TD-15 "Special"!

When 23-year-old Charles Hailey and Lorin Delap, Stigler, Oklahoma, set up for oil field contracting, they chose an International TD-15 Oil Field Special Crawler—as key equipment.

"I had experience with all the new rigs working for other contractors," states Mr. Hailey. "So when I put up my own money, the International TD-15 was my choice.

"First, in operating a TD-15, I proved it could outwork other crawlers. The TD-15 carries bigger loads, moves around faster, has a good 'dozer and a fast winch.

"The '15' is easiest on the operator which means a lot on 24-hour-day hurry-up jobs. Work quality is also improved—it can make better pits with steeper slopes than any other tractor. This sure makes the drillers happy. The big 6-cylinder engine never runs out of power.

"Second is local distributor service. We never had to wait for expert servicemen or parts on International rigs."

Prove to yourself that the 62-inch-gauge International TD-15 Oil Field Special, with 8-foot outside push-arm hydraulic bulldozer, can work circles around competitive rigs. See how features like the 6-speed full-reverse transmission—"single-stick" shift—Shuttle-Bar control and decelerator—all speed up oil field jobs. Let your International Construction Equipment Distributor demonstrate.

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A COMPLETE POWER PACKAGE

Here's veteran crawler operator Charles Hailey, who "bet" on the TD-15 to make oil field contracting go! "Experts figured my first job would take two dozers 30 hours," states Mr. Hailey. "The TD-15 did it alone with time to spare at about one-third the competitive bid. We have been in demand ever since."

The 105-hp TD-15 owned by Hailey and Delap is shown completing a new drilling location near Stigler. The outfit cleared, leveled, made fills, dug a 200-ft. square reserve pit and two slush pits, and cut a road. The whole job took only 18 hours with the TD-15—which rocketed demand for the new firm's services!

Doubts and Hopes Signal the New Year

- **A Petroleum Week survey shows most operators and contractors are optimistic—though cautiously so—about the industry's over-all prospects this year.**
- **Much of the optimism is based on the improved profit picture, resulting largely from the cost-cutting practices initiated in recent years.**

Operators and drilling contractors are generally hopeful that 1961 will be a good year. They are not unmindful, however, that they felt even more optimistic a year ago.

The optimism so many oil men had at this time a year ago, at the beginning of oil's second century, was sorely tried by the hard facts of business life in 1960.

On the plus side, however, is the realization that, while general economic conditions were a far cry from the glowing picture painted by nearly everyone as the new decade opened, the petroleum industry fared pretty well, profitwise. Most oil companies had good profit jumps over 1959, despite the fact that drilling was down and crude production was well below estimates.

The industry consensus is that drilling should hold steady or improve slightly this year.

Opinions and predictions on this score range from restrained pessimism to hearty optimism, with the majority in the mildly hopeful category (PW—Dec.30'60,p13). Most frequent comments: "About the same or a little better than last year," and "Up somewhat."

If the consensus is right, it means that completions will be in the neighborhood of 47,000.

The forecasts, of course, hinge on a "normal" economic pattern. Any unexpected crisis would throw all predictions right out the window.

Here are some typical comments made to PETROLEUM WEEK:

- "It is probable that our company will drill about the same number of holes in 1961 as in 1960. However, we are budgeting slightly more for these wells, since we anticipate that our costs will increase somewhat."
- "If anything, there is a general feeling of reserved optimism, based largely on a recent increase in the price of low-gravity oil and the fact that oil can be sold now, with most of it going at posted prices."
- "We have money available. We will drill anything that looks at all worthwhile. We expect activity to increase."

One operator predicts fewer holes will be drilled this year because "when times get tough, as they are right now, money invested in drilling by non-oil people, such as doctors, lawyers, and the like, is pulled out and placed in 'more desirable' areas."

One major that drilled some 975 exploratory and development wells in 1960 expects to drill around 1,050 holes this year, with increased emphasis on development wells and less on wildcats.

Another major is budgeting for 120 wildcats and 710 development wells in 1961, compared with 135 and 750, respectively, in 1960.

And a third major looks to drill 71 net exploratory holes this year, compared with 60 last year, with much of the increase reflecting a drop in joint ventures by this particular company.

Footage, too, will be roughly the same to a little better this year.

The picture here is a bit more confusing, but the various cross-currents seem to cancel each other out. On the one hand, many operators say they will drill deeper holes; on the other, they say there will be fewer superdeep holes—20,000 ft. and below.

One major that drilled 120 wildcats and 425 development wells in 1960, for a total footage of 1.7-million ft., expects to drill 110 exploratory and 330 development wells this year, with footage down to 1.5-million ft.

In contrast, another major expects its footage to total around 7.7-million ft., roughly 1-million ft. over 1960.

Contractors' Hopes Rise

Drilling contractors apparently have been through the worst. Those who have survived the trials of the past few years should be able to manage better in 1961.

The chief engineer of a major producing company puts it this way: "Those companies remaining in the contract drilling business are pretty well entrenched now. There should be no further thinning of their ranks—at least not of any consequence."

A Rocky Mountain contractor reports footage prices down around 50¢ per ft. on the average for 1960, but he doesn't expect this to worsen—at least not in the immediate future.

"We're keeping our belt tight and bidding tight," he says, "but we are maintaining equipment, replacing on a normal schedule." This firm's drilling dropped some 20% last year, compared with 1959, but profit was about the same, due to depreciation taken.

Another contractor says he is budgeting time more intensely than money. He explains that he is determining as closely as possible all fixed charges and expenses that can be expected. He then figures his day-work return (most of his drilling is on a day-work basis), and divides to determine the number of days per rig to breakeven point. So if he can get in the required 280 to 300 rig days with a month or more left to go in the year, he is then free to bid "for profit" and become more competitive.

One other hopeful sign: Operators are aware of the contractors' situation. Says one major company official: "We have squeezed the drilling contractor as far as he can be squeezed, unless we are prepared to go back into the drilling business ourselves. And we are not."

One problem that may become more pressing to drilling contractors this year is the availability of trained personnel.

One Rocky Mountain area contractor says the personnel situation is "the most frightening aspect of the business today."

Many rig hands are finding work elsewhere, lured by better pay, better living conditions, and more stable working conditions. "New people don't seem to be interested," says another contractor.

Drilling costs and prices are expected to remain steady. And turnkey drilling may increase in some areas, but not significantly over-all.

One major company spokesman says,

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It's known the world over for sheer downright dependability

BAKER RETAINER
PRODUCTION PACKER
PRODUCT 415-D

This great packer has many applications—it's as versatile as it is dependable. It's a single-string production packer that comes in many sizes and bores. Moreover, it is surrounded by a family of accessories that transform it into a dual or triple packer—or into a temporary or permanent bridge plug or squeeze tool. Its formidable pressure-holding capacity makes it in many ways one of the finest of all squeeze packers.

It is set on a wire line—or on tubing or drill pipe. Baker's fast new milling tool mills one out in two to four hours—a fourth the time it once took.

For the latest practical knowledge of how to use Baker Retainer Production Packers, call your Baker Representative.

THE DOUBTS that harass well operators got a real body blow when the now-celebrated Baker Retainer Production Packer was developed some years ago.

This is probably the most predictable (and certainly the most respected) packer ever to go into an oil well. It commands the respect and confidence of operators the world over.

WHAT'S THE SECRET of building a packer so tough and reliable you know it will keep you honest when you recommend it?

For one thing, it takes time—years of performance studies. We've sweated out failures and assessed our successes—sifted out weak points and strengthened the strong points.

This great packer is at work right now in tens of thousands of wells—the average wells, the corrosive wells, the deep, hot, high pressure wells.

THAT'S A TOUGH proving ground—one that has helped us soak up a vast knowledge of what happens to slips, packing elements, and the like, when a packer is downhole. We've got the facts.

Baker made the first retainer packer—for many years the *only* retainer-type packer. The result is a wealth of packer experience that's hard to equal.

This remarkable packer shows it. Over the years we've refined it into a tool that has unyielding stamina. That's why we can call it the most predictable packer of them all.

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RETAINER PRODUCTION PACKER

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"It is possible that drilling costs may go down in some areas as a result of improved bit hydraulics and clear-water drilling programs."

Another operator says there "is little likelihood" of contract drilling footage or day-rate prices changing appreciably this year. He notes, however, that air and gas drilling are proving increasingly reliable as means of cutting bit and mud costs.

Turnkey drilling contracts have been signed by this company in a few areas where the drilling conditions are well known.

But he does not anticipate any general trend to turnkey drilling by the major companies during the year.

Another spokesman, on the contrary, believes the use of turnkey drilling probably will increase, though the significance as compared with footage-rate contracts is not likely to be particularly great this year.

Here Are Areas to Watch

More than a dozen areas of the country will attract major exploratory activity this year. These areas include:

- The Upper Wilcox and Edwards Trends in the Gulf Coast area;
- The Smackover Trend of East Texas;
- The Delaware Basin of southern New Mexico and West Texas;
- Eastern Utah and southwestern Colorado;
- The Green River and Powder River Basins of Wyoming;
- Northwestern North Dakota and northeastern and north-central Montana;
- The Appalachian Basin;
- The Black Warrior Basin of Mississippi and Alabama;
- The Hugoton Embayment area of southwestern Colorado and western Kansas;
- The Cambridge Arch area of northern Kansas and southwestern Nebraska (page 26);
- The Anadarko Basin of southwestern Oklahoma and the Texas Panhandle;
- Several areas in Alaska;
- The Sacramento Valley in California;
- The California and Gulf Coast offshore.

In addition to these broad areas, smaller pockets of heavy activity can be expected in many areas, such as Illinois, Michigan, Ohio, and Alabama.

The impact of reduced allowables, which had an adverse effect on exploratory activity in some states last year, may continue to have a restraining influence.

The relatively high percentage of seismic crews now active in most of the Rocky Mountain states, as compared with Texas and Oklahoma, for instance, has a direct relationship to the lack of market-demand proration in the former states.

As of a few weeks ago, there were only 13 seismic crews active in Oklahoma, a state where, as one observer says, "one can always go out and find a new oil pool or two."

But the consensus is that Texas will not exceed the 104 producing days it had last year.

And, as always, there are some intangibles which could bear heavily on drilling activity.

One official comments, "Managements of several major companies have in recent months been concerned over their reserves picture, as indicated by the large number of small producing companies that have been purchased or merged. While these purchases better the individual positions of the purchasers, astute managements realize that this approach does nothing to increase actual total reserves. And so, with earnings picking up, managements will be more prone to allocate additional funds for exploratory activities that may be expected to pay off in more oil and gas discoveries a few years down the line."

Similarly, any savings which can be made in drilling and production practices represent funds which logically could be plowed back into exploratory efforts.

Included in this category is wider spacing of wells and the resultant elimination of unnecessary development drilling.

Several companies currently have requests before state regulatory bodies to plug older wells where feasible. This trend may logically be expected to take added emphasis this year.

Exploration: Little Change

No significant changes in existing geological and geophysical techniques are considered likely during the year ahead, but there will be increased efforts to integrate information available from all sources.

"No one tool or technique will have the upper hand," says one company's exploration manager. "The day when the oil finder was basically a structural geologist is gone forever. Greater specialization and better overall integration of specialized skills are required today."

And while the current trend toward drilling of wildcat or semiwildcat holes on the basis of log analysis and subsurface correlation can be expected to continue in basins having sufficient well saturation, geophysics will remain the backbone of oil exploration, says one top geophysicist.

"By the time a sufficient well saturation has been attained to make reliable subsurface correlation possible," says this observer, "you have already begun to run out of undiscovered major oil accumulations in that basin."

Efforts undoubtedly will continue to coordinate more closely the activities of geologists and geophysicists this year.

But one major company's chief geophysicist considers the possibility somewhat nebulous. Says he: "We've been giving it [closer coordination] lip service for the past several years, and nothing has happened. There's no reason to expect next year to be any different."

Opinions as to the level of geophysical activity vary from "a continued decline" to "considerably improved."

One exploration manager says: "The trend will be to further leveling off as compared with recent years." He adds that the curve of geophysical activity may continue on a shallow

Some Predictions for the Year Ahead

- *"Continued low allowables will result in fewer wells being drilled because of longer payout periods."*
- *"The major problems facing the production industry in 1961 will be continuation of lower allowables in prorated states, a small increase in domestic demand, a cut in development operating costs, and government interference."*
- *"Exploration emphasis next year will shift from foreign to domestic."*

"Long-range planning for advertising?"

"Certainly," says William E. Hill, managing partner of the New York management consulting firm, William E. Hill & Company, and he explains in this message why planning a company's future must include marketing along with products and processes.

"Half the research and development ever done in this country has been since 1955. This rapid acceleration in technology is having a tremendous impact on the conduct of specific marketing functions such as product planning and advertising. Many companies are rightfully concerned about the increasing emphasis on product and process innovation, the threats of product obsolescence, and the requirements of complex market development. And still a greater research effort is forecast for the 1960's, with R&D expenditures projected to reach an estimated level of $25 to $30 billion by 1970, compared with a present rate of $12 billion.

"The capacity of your company to prosper during the next ten years of undoubtedly swift change—to realize the period's profit opportunities—may well depend on your creative marketing and technology. A 5 to 10-year long-range program, that anticipates product and market opportunities and threats before they develop, can provide the advance and imaginative plans and action for competitive leadership in domestic and foreign markets.

"Such planning is providing valuable and confident insight into the future requirements of advertising and its companion marketing functions. When projected in relation to a company's growth program, many a current advertising program and budget is inadequate for the next 5 to 10 years. By this planning process you can optimize advertising's future role in marketing—and establish the major contribution that sound advertising can play in capitalizing on the new markets, new technologies and new management practices of the 1960's."

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decline this year, but believes that the curve will probably show a tendency to level off in the third and fourth quarters.

A chief geophysicist, on the other hand, notes that oil exploration reached a low during the final years of the past decade, but that its recovery—which might normally have been expected during 1960—was delayed by various unfavorable economic influences.

This delayed buildup, he continues, should begin to manifest itself throughout 1961, probably reaching a peak late in 1962 or in 1963. He feels 1964 "also should be a top year for exploration, after which the historical decline curve likely will begin anew."

Employment in the exploration segment of the industry, therefore, could range from status quo to better.

Those foreseeing little increase in activity, or a continued decline, believe that qualified scientific personnel will have no difficulty finding positions, "but the graduate with minimal degree qualifications will do a lot of pavement pounding."

Registration of geologists is not considered a likelihood in 1961.

Says one leading geologist: "It's a case of the majority being swayed by a vociferous minority. Most geologists approve [of registration], but those who don't talk louder and longer."

Another exploration head adds: "The American Assn. of Petroleum Geologists has to be sold on the idea first."

Cost Cuts Aid Production

In production, the industry now is reaping some of the benefits of the cost-cutting efforts pushed in recent years.

Generally increased profits in 1960 reflect strongly the gains made in eliminating costly frills and practices. The improved picture does not mean that there will be any letup in cost-consciousness; on the contrary, the success of the push will spur continuing efforts.

There will, however, be a shift in emphasis from the do-what-you-can-with-what-you-have approach used by many companies to a more positive search for improvement in tools and techniques.

Research groups will be pressed to come up with improved operating procedures and better recovery methods.

But, as one manager of a major company's research says, "Actually, while we'll be trying in 1961 to come up with new recovery methods, it does not mean we plan to find these methods and have them perfected in 1961. Management has advised us it will need these new recovery methods five years down the line, when there may be some need for this additional oil."

This research man's group "is going back and studying the fundamentals as to why oil is retained in the structure. We think that, by looking at the basic problem, a solution may come to us.

Computers will be used more frequently for such research, as they will be for other exploration and production problems. There also is a demand for even bigger, faster computers.

Other research problems that will get strong attention this year include:

- How to improve methods to uncover deep stratigraphic traps.
- How to develop new logging tools that will be able to distinguish between oil and water in the various formations.
- How to place and control fractures better.
- Continued experimentation with various types of recovery methods.

Some production trends initiated in recent years, such as multiple and permanent completions, will be more prominent this year.

As far as multiple completions are concerned, the feeling is that there will be continued growth in dual and triple completions, but not much beyond this.

Some observers also believe that there will be some activity in quadruple completions, "perhaps more than is generally anticipated."

The trend to use of smaller casing sizes and permanent (tubingless) completions will continue strongly, though there are some operators who believe there is little economic advantage in permanent completions "unless conditions are exactly right."

As for smaller pipe sizes for completion, one major company production engineer says, "Our pipe inventories are now overstocked with 2½-in. tubing, for which there is no immediate demand. We are running 2-in. tubing inside 4½-in. production pipe on the majority of completions."

Other trends that are likely to be prominent this year include:

- Initiation of pressure maintenance operations earlier in the life of a reservoir.
- More automation of smaller tracts. One company reports it is now approaching the point at which it can economically automate leases making 50 b/d of oil or less.
- Consolidation of leases and expanded use of metering devices.
- Increasing emphasis on secondary recovery operations, generally, with waterflooding the mainstay.

Keep Your Eye

Many independents are picking western Nebraska as the Rocky Mountain area most likely to get a concentration of drilling activity in 1961 and succeeding years.

Drilling in western Nebraska is running near the record pace set in 1959. In fact, intentions to drill filed with the state in 1960 had already passed the total for any previous year by the end of November.

Despite marked success in a few areas early last year, the surge in drilling took place in the last half of 1960, and the outlook is for continued growth in 1961.

A Pennsylvanian play along the Cambridge Arch, east of the Denver-Julesburg Basin is pacing the near-record rate of drilling.

Pennsylvanian interest in this area started several years ago, and the first success dates back to 1956. Drilling, however, didn't warm up until 1959, and much of the momentum now apparent developed during 1960.

The current play is centered on three counties—Dundy, Hitchcock, and Redwillow. But scattered exploration has already spread to surrounding counties. The most active area at present is the eastern half of Redwillow County, south of the Republican River, seven to 16 mi. southeast of the town of McCook.

Most of the work done in this area, as well as a good portion of the earlier work done in Hitchcock County, has been by independents.

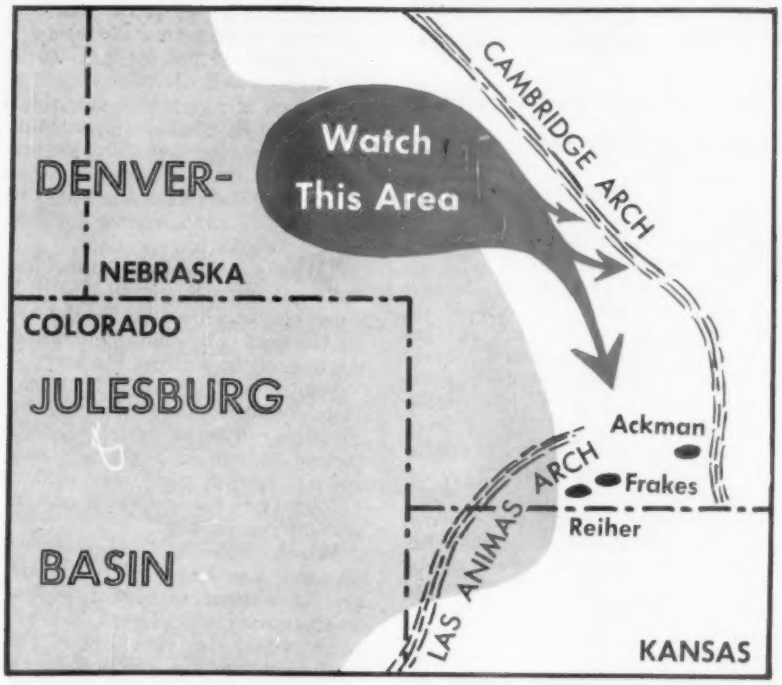
While independents are expected to do most of the drilling, some majors are also active in the rapidly developing Cambridge Arch play.

In Redwillow County, for instance, there are several independents active, including Murfin Drilling Co., Burch Drilling Co., both of Wichita, Jul-Tex Drilling, Pubco Petroleum Corp., M. W. Volentine, and Blair & Associates.

Midwest Oil Corp., U.S. Smelting, Refining & Mining Co., Nebraska Drillers, Inc., McElroy Ranch Co., Alpine Oil Co., M. P. Gilbert, and several other independents have been active, or have announced plans for the future in the county. In addition, Frontier Refining Co., British-American Oil Producing Co., and Skelly Oil Co. have been active in the area.

Several majors, including Gulf Oil Corp., have had strong acreage holdings in this general portion of the state for many years. And several relatively modest stratigraphic programs have been conducted from time to

on Western Nebraska



time since the early 1950s. The present Nebraska play may be said to be a consequence of northwest Kansas Pennsylvanian activity, which got its biggest initial impetus when the Llanos field, Sherman County, was opened in 1958.

The scattered exploration in Nebraska's Cambridge Arch area before the currently active fields were discovered gave the area somewhat of a bad reputation.

Shows in the Lansing-Kansas City were pretty general, but they were commercial in only a few cases. Relatively small recoveries of oil and the usual presence of water with the oil painted anything but a rosy picture.

In fact, no major surge of excitement greeted the discoveries at Frakes and Reiher fields, Hitchcock County, in 1959.

Skelly Oil Co., the most active operator in northwest Kansas drilling in 1958 and 1959, opened Reiher when its No.1 Reiher, section 28-1n-32w, was completed for 348 b/d of oil on the pump.

Skelly also drilled the Frakes field discovery, No. 1 Frakes, section 23-1n-32w, completed for 184 b/d of oil on the pump.

Further development in the two fields did much to upgrade the appraisal of the area. But acceptance of the fact that a new area promising intense drilling activity was at hand was less than universal.

At the present time, Reiher has 20 producing wells, with two failures drilled at the south side of the field. Reiher lies in sections 20, 21, 27, 28, and 29-1n-32w.

At Frakes field, 11 producers have been completed, with one failure on the north side, and another ¾ mi. to the east. The field is in sections 22, 23, 26, and 27-1n-32w.

No drilling has been done in the ½-mi. interval between Frakes and Reiher, and they are now pretty generally regarded as one field—pending either junction of present producing areas or completion of intervening failures.

The one-well Burr Oak field, also discovered by Skelly in the area, has been marked by two unsuccessful attempts to offset. The fact that it preceded Frakes also helped hold enthusiasm for the area in check.

Discovery of the Ackman pool in Redwillow County, however, provided the "convincer" needed to break open the play, which now promises to be a center for independent activity.

The field was discovered by Frontier Refining No. 1 Reiners, section 14-2n-28w, completed for 122 b/d of oil on the pump from the Lansing-Kansas City.

By early December of last year, 44 producers were completed at Ackman, and one location was active in the field. The field is 3-mi. long. During development, production was found in both the Lansing-Kansas City and, in a small area, the Oread member of the Pennsylvanian.

A discovery opening the Sleepy Hollow field followed, 7½ mi. northeast of Ackman.

Murfin Drilling Co. recovered oil from the Reagan member of the Cambrian with its No. 1 Barth, section 25-3n-27w, later completed for 144 b/d from perforations at 3,418-25 ft.

Further drilling also found Pennsylvanian oil (in the Lansing-Kansas City) as well as extending the area of Cambrian production. The field now has 17 producers completed, with 33 locations either active or staked.

Close on the heels of the Sleepy Hollow discovery came one opening the Silver Creek pool, 1-mi. to the south.

Franco-Central Oil Co. recovered oil from the Reagan with its No. 1 Fritz, section 1-2n-27w, which recovered 95 b/d on pump from 3,517-24 ft. This well was later offset by Midwest Oil Co., which found Lansing-Kansas City production.

There is some argument as to whether the formation is really Reagan in the two wells, or whether it is a lower Pennsylvanian zone, not otherwise identified.

While Sleepy Hollow and Silver Creek development has not proceeded to the point of even questionable outline of either field, another apparent discovery east of Sleepy Hollow promises still another pool.

Murfin Drilling and Lewis & Jones swabbed 30 bbl. of oil an hour at No. 1 Gallatin, section 32-3n-26w. This recovery was through perforations at 3,324-28 ft. in the Lansing-Kansas City. The zone was acidized.

The test is 1¼ mi. east of Sleepy Hollow. One venture between this test and the field was a failure.

Development in the area is expected to proceed on a 40-acre pattern.

In the meantime, exploration spreads to ever-increasing distances from present producing areas.

As one consultant and independent put it: "This is going to be the biggest thing as to the amount of drilling in the Rockies for a long while. It could be one of the biggest in terms of reserves. I saw it coming months ago, and moved from Texas into McCook so I could be right on the scene. I was one of the first, but there will be others . . . many of them. Keep your eye on this entire area."

Not everyone agrees with him, but no one will label him rash, either.

Small-Tract Issue Again Boils in Texas

- **The state legislature will be a key battleground for groups seeking to aid, or block, statutory changes.**
- **Generally, the majors favor a change in the allocation formula, with most independents favoring the status quo.**

The controversial issue of small-tract drilling is rising to an even more feverish pitch of interest in Texas.

The issue, resolved to its simplest terms, involves the right of any property owner to drill on his acreage, however small.

Most of the major companies, along with some independents, are in the camp of those seeking to eliminate small-tract drilling.

They are opposed, generally, by a majority of the independents, and their trade associations.

Those opposing small-tract drilling contend that it leads to drilling of unnecessary wells, thereby hiking development costs, and that it violates principles of conservation and good petroleum engineering practice.

Those in support say it protects the right of a property owner to produce the minerals under his land.

A possibly climactic point may be reached if the Texas legislature reaches a vote on a proposed bill to establish a state spacing statute.

Such bills have been introduced in previous years, but none has been reported out of committee. There is no present state statute on well spacing.

There appears to be a stronger push behind the proposed bill this year, though it had not been drafted completely, as of last report. Whether this push will be strong enough to force the bill out of the committee and onto the legislative floor for a vote this year, however, is a question only time can answer.

It's understood that the proposed bill will call for compulsory pooling for drilling permits, with no permits granted for small tracts.

If the spacing pattern in an area is set at 20 acres, for instance, no drilling would be permitted on smaller tracts. Similary, no drilling would be permitted on less than 160 acres for gas, if that is the spacing pattern adopted.

Under the present regulations, operators may drill on less than 20 acres for oil, or 160 acres for gas, under exceptions granted by the Texas Railroad Commission to Rule 37, which controls spacing.

Under such exceptions, permits have been granted for drilling oil wells on less than an acre, and gas wells on as little as five acres.

The commission has granted exceptions to Rule 37 on the ground that such drilling is a right of property. Its decisions have been upheld by the courts in many cases.

The commission's 50%-well, 50%-acreage formula for allocating allowables for oil wells in some fields has been upheld repeatedly by the courts. The one-third-well, two-thirds-acreage allocation formula for gas wells also has been affirmed.

Stanley C. Woods, Houston independent, charges that efforts to make acreage the sole factor in determining per-well allowables "would put the small-tract owner and driller out of business."

Woods, president of Woods Exploration & Producing Co., says that, should these efforts succeed, "the oil and gas industry will suffer a crippling, if not a paralyzing blow."

He contends that the prospect of what can happen in Texas "is so terrifying that public interest must be enlisted in what to non-oilmen might at first glance be an internal difference of opinion."

Woods believes that abolition of the one-third/two-thirds allocation formula would not only prevent an operator from making a profit on a small-tract well, but would even deny him the opportunity to produce at all.

Woods charges that among those seeking to junk the rule "are many who themselves got their start under it."

To illustrate how an operator could be put out of business if the allocation formula was to be established solely on a 100% acreage basis, Woods says: "Let us look at a gas field covering 1,600 acres, with 160-acre spacing rules, and having 10 gas wells, one of which is on a 1-acre tract.

"Each of these wells is capable, let us say, of producing and disposing of 2-million cu.ft. of gas a day, and therefore would get an allowable [on a well-basis] of 666,666⅔ cu.ft. of gas for each well.

"But on acreage, a well on a single acre would be allowed only 1/160th as much as the wells on 160-acre units.

"Its total daily allowable would be only 675,000 cu.ft., against 2-million for the well on 160-acre units.

"At 15¢ a thousand cu.ft., that well would gross the operator $101.25 a day, against $300 a day for the well on 160 acres. The drilling and operating costs of the wells are the same.

But, Woods says, if only acreage "was considered in establishing the allocation formula, an individual owning an acre in a gas field with 160-acre spacing could only produce 1/160th of the well's maximum efficient rate of flow."

Woods adds that, whether the allowable was based solely on acreage, or whether mandatory pooling or unitization was ordered, the end result would be the same: "The small tract would be practically without value; there could not be a well drilled on it economically."

The Houston independent further claims that elimination of the one-third/two-thirds allocation rule would put the landowner at the mercy of the lessee.

Before the discovery of oil or gas in an area, he says, the owner of a small piece of land "is seldom offered enough cash to justify him in entering into an oil and gas lease.

"More often than not, he will therefore pass up the bonus offered so that he may be able to make a better trade in the event that the area proves to be productive."

Take away the rule, he continues, and the landowner is lost, "for no one would ever have to buy a lease or pay royalty for a parcel of land that could be drained without compensation."

Without the right of the individual to produce economically the minerals under his property, under the Rule of Capture, Woods says, the ownership of the minerals has little value.

Woods says that the present policy could be reversed in two ways: (1) by refusal of well permits for small tracts; and (2) by elimination of the per-well factor in the proration formula.

"In either event," he continues,

"there would be no need for an operator who was 'taking a block' in a promising wildcat area to bother buying leases on isolated small tracts.

"He could drain the oil or gas from the small tracts through wells on the larger leases, without a cent of compensation to those small-tract owners.

"He could be sure that no independent operator would drill a well under a 100%-acreage allocation formula, because such a well on a small tract would never pay out."

Michel T. Halbouty, who has been in the forefront of those advocating a change in the allocation formula, contends that the application of Rule 37 has been "abused."

The Houston independent, who has conducted a virtual crusade on the subject during the past year, told PETROLEUM WEEK that, "Rule 37 is absolutely silent as to how much oil or gas may be produced from any well drilled, either under the spacing pattern adopted for a field or as an exception to Rule 37."

Halbouty says this is important to remember, "for much confusion arises over the contention of owners of segregrated small tracts that, in some fashion, Rule 37, when taken with the Law or Rule of Capture, requires the operator who drills on a segregated tract be allocated a quantity of oil or gas sufficient to pay for the well and return a profit.

"As fantastic as such contention sounds in the light of the simple exception to Rule 37, it is repeatedly made."

Halbouty also charges that the Rule of Capture is misinterpreted.

The Rule of Capture "is court-made law," he says. "It was not passed by the legislature, and is not contained in a rule or regulation.

"But let me say that I consider the Rule of Capture a profound and useful conservation measure. Again, only its misuse, abuse, and misinterpretation is evil—against the public interest—and completely illegal."

Halbouty charges that the most serious misunderstanding in applica- of the rule "is the assertion by town lot and segregated small-tract operators that the rule means more than nonaccountability to adjoining owners.

"These people contend that the allocation formula must afford the single well on a segregated tract enough production from that well to pay for the well, plus a profit, even though that amount is not originally in place under the tract, and clearly will have to be drained from adjoining tracts."

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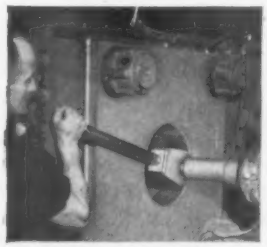

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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Mississippi Sets 80-Acre Spacing for Oil Pool

Mississippi's McElveen pool in Amite County is the first in the state to go on 80-acre spacing.

The four-month-old pool is the first given more than 40-acres by Mississippi's Oil & Gas Board.

Pan American Petroleum Corp., operator, contended that 40-acre spacing would result in drilling unnecessary wells to develop the Lower Tuscaloosa pool. And the company now estimates that 80-acre spacing may save some $8-million to $10-million in developing the area. McElveen now has two producers. Two years ago, the board rejected a petition by a group of majors and independents seeking a permanent change in the statewide oil field rules from 40-acre to 80-acre spacing.

But in turning down the petition, the board said it would entertain petitions asking for exceptions to the 40-acre spacing in individual fields where findings could justify wider spacing.

Justiss Mears Oil Co. opened McElveen last July with its No. 1 Nunnery, section 23-3n-6e.

Pan American is the largest leaseholder in the area with 100,000 acres, although it has farmed out acreage to Justiss Mears and others.

•

Canadian Petroleum Assn. Seeks Tax Cuts

The Canadian Petroleum Assn. is urging a change in Canadian tax laws to cut unemployment and increase Canadian participation in oil and gas development. John W. Proctor, general manager of CPA, stated the association's case in a letter to Prime Minister John G. Diefenbaker.

The submission calls for a broadening of the Income Tax Act to permit a 25% deduction on those expenses incurred by Canadians—individuals and companies—in the search for oil and gas in Canada.

"The effect of the present tax provisions," Proctor wrote, "is to reduce the incentive for Canadians to explore for and develop reserves, since further expenditures have the effect of reducing the depletion allowed."

Proctor said the suggested revisions would "help to reduce the disadvantages encountered by a Canadian operator in competing with U.S. corporations and individuals in the Canadian oil and gas industry."

•

First Private Helium Plant to be Built Soon

Construction will soon get under way on the first privately financed helium plant in the U.S.

Kerr-McGee Oil Industries, Inc., will build the plant, designed to process 2.5-million cf/d of gas, in the Pinta field, Apache County, Ariz. Wells capable of producing gas are shut in pending completion of facilities. Kerr-McGee engineers calculate that the Pinta field has reserves of 7.5-billion cu.ft. of gas. Recoverable reserves of pure helium would then be 0.6-billion cu.ft.

•

Arkansas Is Enforcing Brine Disposal Rules

The Arkansas Water Pollution Control Commission is cracking down on oil operators who ignore regulations requiring the use of salt water disposal systems.

In the past few weeks, the commission has filed suit against the operators of many wells in four separate fields. The commission seeks to halt production until the operators have filed for and received permits for salt water disposal systems.

Petitions have recently been filed against H. J. Heartwell, Ft. Worth, and Roy Roberts, Urban, Ark., operating in the Urbana field of Union County. Earlier, the commission filed suit against operators in the Champagnolle Landing, Mud Lake, and Cross County Slough fields, all in Union County.

•

Western Development Co., Delaware, has paid $621,000 for a one-third working interest in 935 Penn-Ohio Gas Co. oil and gas leases.

Approximately 207,400 net acres—located mainly in Wyoming, and in Colorado, Montana, Utah, and New Mexico—are involved. There is no production on any of the acreage.

Western has entered a lease management and operating agreement with Hiawatha Oil & Gas Co. and Benedum-Trees Oil Co., with Hiawatha as manager.

•

The Bureau of Land Management's petition to rehear a court order holding the bureau cannot cancel oil and gas leases by administrative action has been denied by the U.S. Circuit Court of Appeals (PW—Nov.18'60,p44).

Bureau officials in Wyoming say the matter has now been referred to the Justice Dept. to see if further appeal should be taken or if the bureau should file an action in the U.S. District Court at Cheyenne to void oil and gas leases held by Pan American Petroleum Corp. and others. The circuit court had ruled that was the only legal procedure for canceling leases.

•

Bids are due Mar. 3 on the offering of another parcel off Santa Barbara County, California.

The offering is Parcel No. 2, comprising 4,250 acres adjoining Parcel E on the east. Parcel E, awarded to the Phillips-Pauley-Kermac et al group

Hunt Tells Purchasing Agents: 'Buy American'

H. L. Hunt, president of Hunt Oil Co., is giving suppliers of tubular goods, and other oil field equipment something to cheer about, with a new "buy American" order.

The Dallas oil man says he has instructed purchasing agents of his various companies that henceforth they should buy domestic rather than foreign steel products.

Hunt says he was not aware until recently that his organization was buying foreign steel. He adds: "It is 20% cheaper to buy the foreign steel, but I did not know what steel we had been buying. Even though it will cost me more money, I have instructed our purchasing department to buy domestic steel."

in 1958 for a cash bonus of $5.1-million, is the site of 11 stratigraphic tests. It soon will be developed with a 33-well platform. The first well is slated to be spudded within the next two weeks.

Bids are due Feb. 3 for Parcel No. 1, adjoining Parcel E to the west.

•

Producing Properties, Inc., has acquired interests in 47 gas wells in River Island, East River Island, and Isleton fields, Sacramento and San Joaquin Counties, California.

The company paid Vistario Corp. $1,650,000 for the properties, which have gas reserves estimated at over 14.7-million cu.ft. This was PPI's seventh California purchase during the past 16 months.

•

Standard Oil Co. of California will farm out the southern half of its offshore Parcel B, 20 mi. west of Santa Barbara, California.

Shell Oil Co. will take over the 1,920 acres involved. Shell plans to drill a 10,000-ft. test on the acreage, using Global Exploration Co.'s CUSS I to drill the hole in 230 ft. of water.

Stancal has not yet developed production on the parcel, which is the only one of five awarded in 1958 on which production has been found.

•

Two Texas independents will again try to find oil in southeastern North Carolina next spring.

Coastal Plains Oil Co. and Roderick A. Stamey, both of Houston, have notified state geologist Jasper L. Stuckey of their plans.

•

Engineering

A rotary drilling hose constructed with four spirally wound plies of heavy steel wire is being offered "to withstand the highest pressures encountered in drilling today."

Skinner Bros. Co.'s new S-B-C Crown mud suction hose has heavy spring-steel coil construction, and is collapse-proof, the company says.

•

A combination tool to prepare a wellbore for hydraulic fracturing by the V-Notch method is now available.

Grant Oil Tool Co. is manufacturing the V-Notcher under license from Gulf Oil Corp., which perfected the process.

The tool is an adaptation of the Grand hydraulic expansion two-blade wall scraper.

•

Drilling Highlights

Kansas—Dunne-Bardner Drilling Co. No. 1 DeVore, section 12-24s-15w, Stafford County, flowed 30 bbl. of oil per hour through perforations at 4,096-100 ft. in the Arbuckle. The prospect is ¼ mi. south of East Macksville pool, which produces from the Viola, with a dry hole intervening.

In Rice County, Pure Oil Co. No. 1 Thode, section 26-21s-8w, flowed 12 bbl. of oil per hour on drillstem test at 3,345-425 ft. in the Mississippian. The wildcat is midway between Dymond and Sterling pools, some 5 mi. apart.

South Louisiana—Tennessee Gas Transmission Co. No. 1 J. A. Seegers et al Unit, section 3-23n-8w, Claiborne Parish, flowed at an estimated rate of 720 b/d of oil and gas at the rate of 1,670,000 cf/d through ¼-in. choke on drillstem test of the Smackover at 9,907-58 ft. Nearest Smackover production is 2¾ mi. southwest, in the Haynesville field.

Mississippi—Humble Oil & Refining Co. No. 1 Thompson, section 3-9n-1w, Yazoo County, 5 mi. northwest of Flora pool and 6¾ mi. west of Virlillia pool, flowed 193 b/d of oil through perforations at 10,445-53 ft. in the Hosston.

West Texas—Gulf Oil Corp. No. 634 W. N. Waddell, section 7, block 3, H&TC survey, Crane County, flowed 140 b/d of 45.6 gravity oil through 16/64-in. choke and perforations at 5,655-725 ft. in the Devonian. The test is 1½ mi. north of Cordona Lake pool and the same distance northeast of McKee pool, both of which produce from other formations.

Oklahoma—Arkansas Louisiana Gas Co. No. 1-A Ott, section 27-21n-9w Major County, 3 mi. south of South Mena pool, was completed for 640 b/d of oil through 20/64-in. choke and perforations at 7,084-92 ft. in the upper Manning.

In Love County, A. D. Britton No. 1 Smith-McGeehee, section 25-8s-1e, flowed 239 b/d of 44-gravity oil through 12/64-in. choke and perforations at 7,315-19 ft. in the Pennsylvanian. The prospect is 4 mi. northwest of Thackerville pool.

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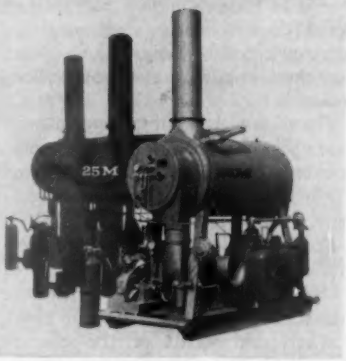

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To minimize costs and maximize profits in today's highly competitive business, with today's increasingly complex plants, processors are giving increased importance to operations research.

They are becoming increasingly aware that the operation of every unit in every plant must be closely geared to the over-all operation of the company.

For example, to derive the best over-all result from the operation of a cat cracker, management must take into consideration not only the specifications and yields of the effluent streams, but the availability of the most economical feedstocks, the seasonal variations of the market, the geographical location of the plant, and the possibility of another plant of the same company being able to supply a portion of the market at lower cost.

Operations research supplies the data that makes it possible to operate such an over-all system in the most advantageous manner.

Operations research is the application of mathematics, scientific methods, and the mechanical tools that go with them to problems that govern the operations of a company, in order to determine the optimum solutions.

It was first applied in Great Britain during World War II. Operations research then concerned itself with military logistics; for example, it was used to see that the right supplies arrived at the right spot at the right time.

After the war, operations research caught the interest of businessmen.

The development of electronic computers during the last decade has helped immensely in making its application practical.

Operations research does not take over the decision-making functions of the management. It simply provides management with sounder bases for making its decisions. Basically, it

How Linear Programming Solves a Typical Problem

Assume a company with five refineries, designated R_1 to R_5, and eight bulk plants, designated B_1 to B_8. Among them, the five refineries can produce, and the eight bulk plants can sell, 4,200 b/d of a specified product. The problem is to determine the amount of the product to be shipped from each refinery to each bulk plant to minimize total transportation cost. Here's how it's done:

BULK PLANTS

REFINERIES	B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_8	Refinery production in barrels
R_1	1 X_1	3 X_2	8 X_3	6 X_4	2 X_5	4 X_6	9 X_7	3 X_8	1,200
R_2	9 X_9	8 X_{10}	2 X_{11}	6 X_{12}	4 X_{13}	2 X_{14}	1 X_{15}	7 X_{16}	600
R_3	3 X_{17}	1 X_{18}	1 X_{19}	4 X_{20}	2 X_{21}	6 X_{22}	9 X_{23}	5 X_{24}	950
R_4	4 X_{25}	5 X_{26}	5 X_{27}	6 X_{28}	6 X_{29}	7 X_{30}	7 X_{31}	5 X_{32}	1,200
R_5	4 X_{33}	2 X_{34}	4 X_{35}	1 X_{36}	3 X_{37}	6 X_{38}	9 X_{39}	2 X_{40}	250
	500	600	300	75	1,200	800	400	325	

Bulk plant sales in barrels

The figures at the right of the matrix represent the daily production at each refinery of the product under study. The figures below the matrix represent the daily sales at each bulk plant. The figures at the top of each square in the matrix are the transportation rates to each bulk plant from each refinery, and the unknowns X_1, X_2, X_3 . . . are the number of barrels to be shipped to each bulk plant from each refinery.

To minimize transportation costs, a first equation is given to the computer, tending to set the total transportation rate to zero:

$$1X_1 + 3X_2 + 8X_3 + 6X_4 \ldots\ldots\ldots + 9X_{39} + 2X_{40} = 0$$

The next equations fed to the computer simply sum up the delivery figures in each horizontal row to equal the production of each refinery, and sum up the figures in each vertical column to equal the sales of each bulk plant:

$$X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 + X_8 \ldots\ldots = 1{,}200$$
$$X_9 + X_{10} + X_{11} + X_{12} + X_{13} + X_{14} + X_{15} + X_{16} = 600$$

. . . . . .

. . . . . .

$$X_8 + X_{16} + X_{24} + X_{32} + X_{40} \ldots\ldots\ldots\ldots = 325$$

The computer will come out with the following solution, showing the number of barrels to be shipped to each bulk plant from each refinery so as to minimize total transportation cost:

BULK PLANTS

REFINERIES	B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_8	Refinery production in barrels
R_1					1,150	50			1,200
R_2						200	400		600
R_3		600	300		50				950
R_4	500					550		150	1,200
R_5				75				175	250
	500	600	300	75	1,200	800	400	325	

Bulk plant sales in barrels

points out the optimum allocation of a company's resources.

It can be used for three purposes:

(1) To advise management about alternative solutions to meet a given objective.

(2) To develop new methods for making decisions.

(3) To educate those in control in scientific methods, rather than letting them manage "by intuition."

Operations research has already been used by oil companies for many problems. Among them:

- Inventory policies, at refineries as well as at distribution points;
- Production scheduling and transportation problems;
- Blending of ingredients;
- Service station locations and sales forecasts.

"Many of these problems are not independent of each other," says Wilfred C. Hugli, Jr., operations research manager of Cities Service Oil Co. "A plant manager who wants to determine how much of various products to manufacture in a given period must make a complex and often difficult decision.

"He must consider such factors as raw material availability, production sequencing and scheduling, inventory levels, actual and forecast sales, cost of every item in the process, and customer service.

"The objective is to obtain an economic balance between production flexibility, inventory investment, distribution costs, and customer service."

Operations research works best when it deals with specific measurable and controllable factors, such as are encountered in production, refining, and transportation. Then it can make use of proven scientific techniques such as "linear programming" (box, page 32).

The basic function of linear programming is to obtain, objectively, optimum and suboptimum solutions for any given set of variables—restrictions and objectives—that are linear; that is, proportional to each other.

Linear programming is also applied to optimize "mathematical models" of the problem to be solved.

"A definition of the term model," says Ed Tomeski, data-processing research assistant of Socony Mobil Oil Co., "is that of a system of equations describing the problem under study, in such a fashion that all proper considerations are explicitly stated, so that a solution of the system of equations is, in fact, the solution of the real problem."

Obviously, the first requirement is to define the problem. The second is to collect and analyze the important variable factors; sometimes hundreds or even thousands of factors have a bearing on a particular problem.

With these factors, the model is constructed. Then the model must be solved for each set of variables—by means of an electronic computer—until a solution is found that cannot be improved upon. This is followed by a period of testing, under actual conditions, after which the solution selected as optimum is put into effect.

Operations research is given a real challenge when it endeavors to deal with market conditions, which introduce the human element.

Specialists in operations research from many oil and petrochemical companies all told PETROLEUM WEEK that the market angle had necessarily been the neglected area, because it is fraught with irrationality. Yet it has a momentous influence upon a company's economics.

"A well-analyzed oil company operation, from the oilwell to the point of distribution, is folly," Tomeski says, "without the injection of meaningful market demand. But here the great challenge is uncertainty."

In such a case, operations research must call to its assistance such sophisticated techniques as the mathematical probability theory, and the theory of games.

The essential difference between these theories and the other mathematical methods used in operations research lies in the fact that here certain factors necessary for the computation of the results are unknown. They must be arbitrarily assumed.

In using probability, the researcher has previous experience—statistical data—to go by. In game theory, he has none; here the researcher must select values for his unknown variables in much the same way as he would plan a move in a game of chess—which explains the name.

The idea is to take advantage of competitors' relative strength and weaknesses, to minimize the risks, to use of the "concept of least regret."

Refiners and petrochemical manufacturers are establishing extensive operations research training programs to develop specialists in that science.

Initially, many of these companies called in outside consultants to perform their operations research work. Cities Service, for example, obtained the services of Arthur D. Little, Inc., and of J. Benton Vandergrift Associates. Then Vandergrift demonstrated the value of linear programming to the company's top executives—the president and several vice-presidents took two-day "classes"—and now a substantial number of key line and staff personnel are being trained within the company's own ranks to carry out the work.

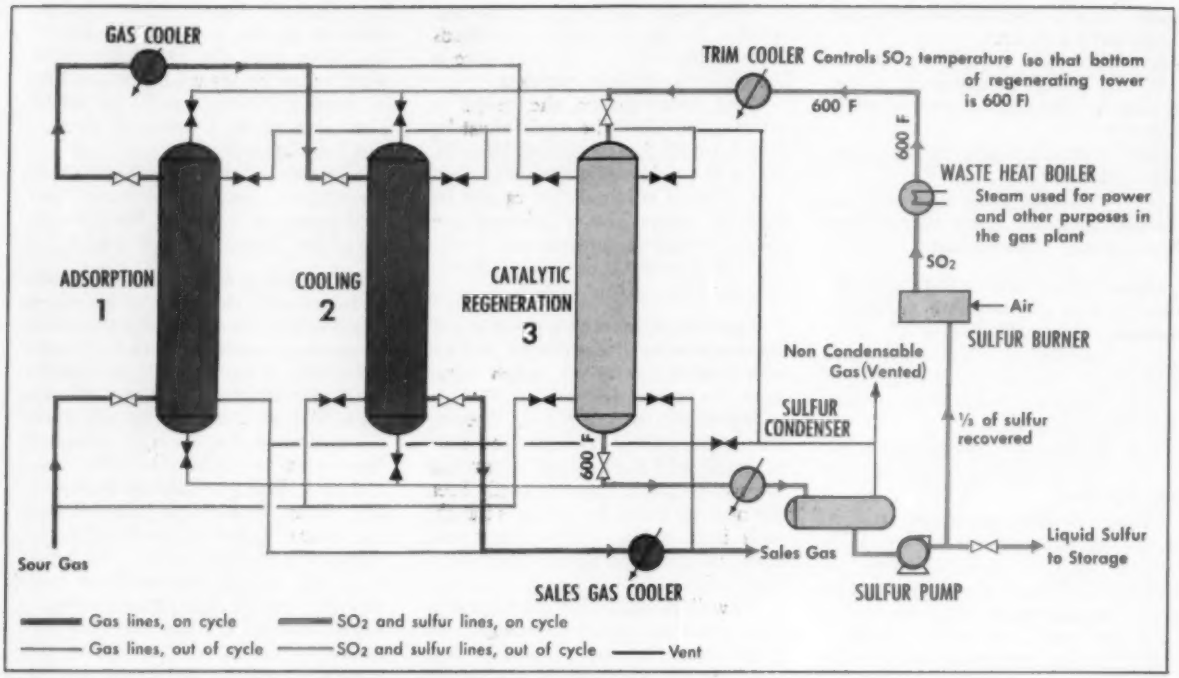
Socony Mobil has followed a somewhat similar pattern. The top executives were the first to be exposed to the "seminars" which are now conducted regularly. Over 100 key men have attended the classes to date.

"Management is extremely interested in operations research," Tomeski told PETROLEUM WEEK. "The difficulty is to train enough analytically minded people, and personnel sufficiently competent to do the actual application of the theory they have learned."

Gulf Improves Its Ethylene Production

Ethylene production facilities are being expanded and improved at Gulf Oil Corp.'s Port Arthur (Tex.) refinery. In this plant, some of the purest ethylene available is being manufactured.

Ethylene is the starting material for an enormous variety of petrochemicals. Successive conversions transform it into polyethylene, ethyl alcohol, ethylene oxide and chloride, and polyvinyl chloride, used in the manufacture of plastics, fibers, rubber, solvents, detergents, antiknock additives, and many pharmaceutical products.



The Haines Process Uses Three Reactors in Rotation, as . . .

Molecular Sieves Recover Sulfur In Unusual Sweetening Process

A new and original application of molecular sieves is for the simultaneous sweetening and dehydrating of sour natural gas, and the recovery of liquid sulfur.

The calcium-aluminum silicate zeolites known as "molecular sieves" (PW—Jun.26'59,p34) are an excellent catalyst for the Claus reaction—the reaction between hydrogen sulfide and sulfur dioxide to form free sulfur and water vapor.

When molecular sieves are used to adsorb hydrogen sulfide from sour natural gas, they can be regenerated by passing over them a flow of sulfur dioxide, at about 600F. The result is sulfur vapor and water.

The process was developed in the Houston (Tex.) laboratories of Krell Associates. Now a pilot plant with a capacity of 100,000 cu. ft. per day is being constructed in Canada, by Maloney-Crawford Tank & Service Co., Ltd.

Harry Haines, of Houston, inventor of the process and vice-president of Krell, is also president of Western Sulphur Recovery, Ltd., Calgary, Alta. WSR holds the patent rights for Canada, and Maloney-Crawford makes the installations.

The plant consists essentially of three towers in series, acting, in rotation, as adsorbing, cooling, and regenerating reactors. The cycles are short—45 to 180 minutes according to the sulfur content of the gas.

The sour gas enters the bottom of the adsorption tower (diagram) where the molecular sieves get "loaded" with H_2S. After passing through a small cooler, the sweetened gas flows downward through the second tower, where sweetening is completed, and further cooling takes place.

The gas is then ready for sale.

Meanwhile, the molecular sieves in the third tower are being regenerated. The hydrogen sulfide that is trapped in them is combined with hot sulfur dioxide, flowing downward. Sulfur and water vapors, some nitrogen, and a little residual SO_2 leave the bottom of this reactor.

The sulfur is condensed and sent to storage; the noncondensable gases are vented to the atmosphere.

About one-third of the sulfur recovered is burned to form the sulfur dioxide that is needed to regenerate the molecular sieves.

The hot SO_2 produced by the combustion of sulfur and air is introduced, at a carefully controlled temperature, into the top of the tower that is ready for regeneration.

When regeneration is complete, a set of valves automatically changes the sequence of operations through the three reactors, simply by changing the flow of gases and of sulfur dioxide. The tower that did the cooling becomes the adsorption tower, the regenerating tower becomes the cooling tower, and the molecular sieves that have just been loaded to capacity in the first tower are regenerated.

On its way from the sulfur burner to the regeneration tower the SO_2 is passed through a waste-heat boiler.

A commercial plant capable of treating 8-million cu. ft. per day of natural gas containing 15% of H_2S, with a recovery of 40 long tons of sulfur daily, would cost about $600,000, exclusive of off-site facilities, according to Krell.

Cooling water is the only essential utility required. The plant derives its energy requirements from the sulfur—in the form of steam—and not from fuel gas. This, says Krell, is an important advantage of the process, in view of the trend toward higher natural gas prices and lower sulfur prices.

Rotary Trays Cut Fractionation Cost

A rotary-tray fractionating tower with an exceptionally low pressure-drop, resulting in a high throughput, will soon be available to U.S. refineries and petrochemical processors.

The tower—or distillation column—was invented in Sweden by Stora Kopparbergs Bergslag A.B., and has been sold in Europe for some time by the German firm of Mueller-Schuss Kg. It is used there principally in chemical plants.

Stora has licensed Vulcan-Cincinnati, Inc., to manufacture and distribute the tower in this country, and a pilot plant is at present being built, according to W. D. Beers, Vulcan vice-president and general manager.

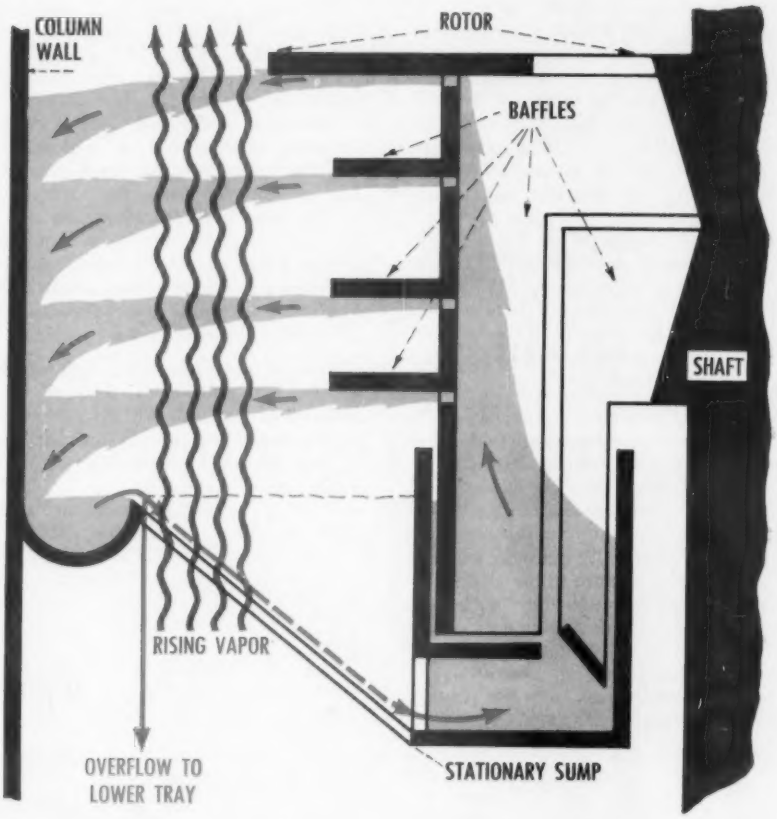
What gives the apparatus its unique advantage is that the liquid, at each stage of its downward flow, is flung by centrifugal force against the inner surface of the shell of the tower, and is easily traversed by the rising flow of vapor (diagram).

This assures an intimate vapor-liquid contact, and reduces the pressure drop through the column. The reason is that the vapor does not have to "push its way" through a layer of liquid on each tray, as it does with even the most efficient of bubble trays or sieve trays.

The pressure drop through a rotary-tray tower is less than 1 mm. of mercury, according to Vulcan.

This is less than one-tenth the average pressure drop through an equivalent sieve-tray column.

As a result, Vulcan says, a rotary-tray tower will accomplish the same work as a conventional tower of much larger diameter.



Vulcan has not revealed the speed of rotation of the trays, nor the power needed to drive the "rotor" of trays.

Mueller-Schuss has built Stora towers varying from 20 in. in diameter with 15 trays, up to 55 in. in diameter with 10 trays. It says that a 39-in. tower with 10 stainless steel rotary trays should cost about $15,000.

In the fight against fuel oil ash corrosion . . .

New Alloys Prove Most Effective

A high-chromium, high-nickel alloy—such as 60Cr-40Ni—may be the answer to the corrosion of industrial heating equipment by residual fuel oil ash.

Residual oils containing significant percentages of sulfur, sodium, or vanadium keep giving excessive difficulties when burned in boilers, heaters, gas turbines, and other high temperature equipment. These elements form an ash, which attacks the metal parts of the equipment that are exposed to the flow of gases.

A description of the latest tests conducted with high-chromium, high-nickel alloys by International Nickel Co., Inc., and an appraisal of how successful these alloys have been, were given by Inco's metallurgists D. W. McDowell, Jr., and J. R. Mihalisin, at the recent annual meeting of the American Society of Mechanical Engineers in New York.

Two series of extensive tests were conducted. In one, "test racks" of various alloys were installed at strategic locations in actual boilers fired with bunker C fuel oil.

These field tests were conducted with 14 high-temperature test racks installed principally in the superheater section of various oil-fired boilers. In some of those, additives were used along with the fuel. The vanadium content of the fuel oil varied from 150 to 450 ppm., and the temperature varied from 1450F to 1750F.

These tests showed that alloys with a higher chromium content were more resistant to corrosion.

A second series consisted of "crucible tests," where the alloys were placed, in the laboratory, in an environment duplicating actual service conditions.

These crucible tests were run at the Naval Boiler & Turbine Labora-

tory of the Philadelphia Navy Yard. They are relatively simple. The alloys under test are heated to the desired temperatures—generally around 1,700F—for 100 hours, in a porcelain crucible containing a synthetic mixture duplicating the ash formed during combustion of bunker C fuel oil.

That synthetic ash contained 15% sodium sulfate and 0.85% vanadium pentoxide, which is considered the most corrosive combination of the compounds.

At the conclusion of the tests, the samples were sandblasted to remove the scale, and weighed. The loss of weight of the samples between the beginning and the end of the tests was used as an indication of their resistance to corrosive attack.

The 60Cr-40Ni alloy proved to be far more corrosion-resistant than commonly used stainless steels.

The widely used 316 stainless steel, Inco said, "suffered almost catastrophic attack under these [crucible test] conditions, while 309 stainless gradually developed resistance to the attack."

But the 60Cr-40Ni alloy "withstands fuel oil ash environments exceptionally well," according to the Inco metallurgists. And it does not suffer "sulfidation," they say, like Inconel does. Inconel withstood the crucible tests very well, but the sulfidation sensitiveness proved that it was not too satisfactory in actual service.

Metallographic inspection revealed that no subsurface attack of the specimen took place in the crucible tests; the scaling was due only to oxidation.

In order to simulate more closely "service experience," a high-sulfur gas atmosphere was also used over the fuel oil ash containing the specimen. In that test, both oxidation and sulfidation took place with certain of the alloys. The 60Cr-40Ni, however, appeared to develop a hard protective layer of nickel and chromium oxides ($NiO\text{-}Cr_2O_3$).

Various methods tried heretofore to protect equipment against the attacks of fuel oil ash do not give results anywhere near as satisfactory as the use of high-chromium, high-nickel alloy, Inco says.

Among protective methods that have been tried, or are being used are:

- Treatment of the fuel oil to remove the metals producing the objectionable ash. Unfortunately the cost of these treatments is generally prohibitive.

All the objectionable components not removed by the "desalting" treatment of the crude at the refinery (PW—Jan.8'60,p43) are concentrated in the residual fuel oil. And, to the sulfur, vanadium, and sodium found naturally in the crudes, must be added the corrosive constituents that oil transported by tankers will generally pick up from salt water.

- Protective coatings. Up to this time, Inco says, their use on parts that must operate at temperatures above 1,000F has not been successful.
- Design changes of the equipment. When the temperature of critical parts can be maintained below 1,200F, or when, by a change of design, the air-to-fuel ratio of the combustion process can be lowered, corrosion can be substantially reduced. But such changes are not always possible or practical.
- Additives to the fuel oil. These have proved reasonably effective in many cases (PW—Jun.19'59, p73). Magnesium in the form of oxide or sulfate, added to the oil either as a fine powder or in an aqueous slurry, is giving good results in certain boilers and gas turbines. But conditions differ from one case to another. There is little agreement about the protective effectiveness of magnesium, aluminum, zinc, phosphorous, and calcium compounds in various portions of the equipment.

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What's New / IN PROCESSING

A new high-pressure process developed by the Montecatini interests in Italy will be used in the United States to make acetylene by partial oxidation of methane, at a new Diamond Alkali plant at Deer Park, Tex. The plant's capacity is expected to be 35-million to 40-million lb. a year.

The higher operating pressure, Montecatini claims, allows recovery of considerable amounts of steam for regeneration of the solvents used to purify the product gas. The process also injects gasoline into the reaction flame, and utilizes the heat of the reaction to crack the gasoline into more ethylene and acetylene.

•

Air Product, Ind., will provide low-temperature equipment for the first privately-financed helium extraction plant in the United States. Kerr-McGee Oil Industries, Inc., is constructing the plant in the Pinta Field, Apache County, Ariz.

The Air Products process cools the feed gas with liquid nitrogen to below −300F, to separate other components from the helium. Pinta Field nitrogen-helium gas contains about 8% helium.

The Pinta plant will be capable of processing 2.5-million cf/d of natural gas, and will produce a 99.995% pure helium.

•

A 2,600 b/d hydrodesulfurizer, under construction at the Sarnia (Ont.) refinery of Sun Oil Co., Ltd., is expected to be on stream in May.

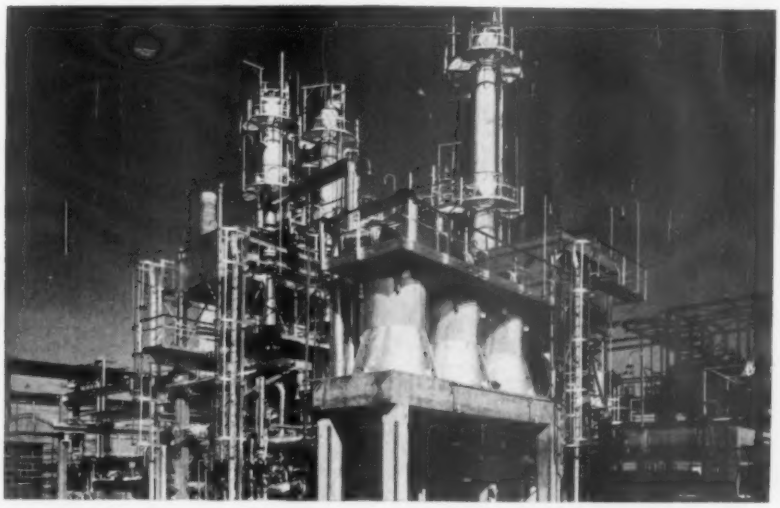
The unit will use a special catalyst to produce heating oils with greater stability and lower sulfur content, the company reports.

The same process is already being used at Sun Oil Co.'s Marcus Hook (Pa.) and Toledo (Ohio) refineries.

•

California Chemical Co. will construct an ammonium nitrate and a nitric acid plant this year at Ft. Madison, Iowa. The plans will be part of a complex of chemical fertilizer plants Cal Chem is planning at Ft. Madison.

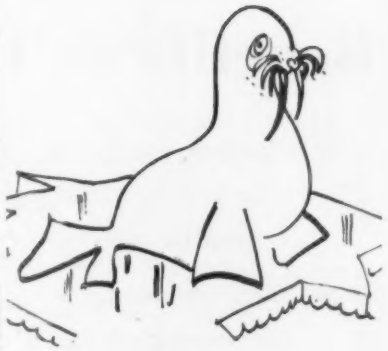
The Standard Oil Co. of California subsidiary plans to market a complete line of chemical fertilizers in the Midwest and Northeast.



Oklahoma Gets First Cyclohexane Plant

The first plant for cyclohexane production in Oklahoma has gone into operation at Continental Oil Co.'s refinery at Ponca City. Its capacity is 20-million gal. per year.

Hydrogen from the refinery's reformers is used at the plant to convert benzene to high quality cyclohexane, which is primarily a raw material for the manufacture of nylon. Cost of the new plant at Ponca City was $1-million; Procon, Inc., Chicago, was the contractor.



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Benefits of Technology Will Spread

- **Pipeline companies foresee increasing use this year of precoated pipe and polyethylene tape in the battle against corrosion.**
- **More attention is expected to be paid to improvement of batch detection equipment.**

The outlook for technological progress in the pipeline industry this year is for refinement and wider use of newly developed equipment, materials, and techniques—rather than for bold innovations.

The industry will finish adopting and perfecting equipment and methods that only recently have come into existence before launching major new research projects.

This is the forecast of major pipeline companies surveyed by PETROLEUM WEEK.

Broader use of still new corrosion-resistant materials is foreseen.

Many pipeline companies consider this multimillion-dollar problem one of the most critical facing the industry. All appear hopeful, however, that corrosion-control practices and materials now in limited use will provide effective solutions as their application is broadened.

Greater production and use of pipe mill-coated with a thin corrosion-resistant film of synthetic resin is forecast.

"More and more mills can be expected to offer something in the way of precoated pipe within the next few months," says the president of one major's pipeline affiliate. "This type of pipe is particularly applicable for short jobs, since its use does not necessitate hiring large field gangs. And as short jobs appear to be about all that are in the cards for next year in the way of crude line construction, you can look for good acceptance on the part of pipeline companies."

The general manager of a large pipeline company, while predicting that asphalt coating will continue to be the main corrosion-preventive this year, says "I look for a considerable increase in the use of thin-wall coatings."

Hill Hubbell Co., Cleveland pipecoating firm, will start coating pipe this spring with X-Tru-Coat, a polyethylene film developed by Republic Steel Co.

The high-density coating will be applied to pipe in diameters ranging from ¾ in. through 5 9/16 in. under licensing agreements with Republic.

Many gas transmission and distribution companies are already using the Republic precoated pipe and report that it has withstood corrosion well both in buried lines and in out-of-doors storage prior to installation (PW—May13'60,p46).

Hill Hubbell says that coating of pipe in diameters up through 8 in. is being considered.

The application process involves first covering the pipe with an adhesive and then extruding polyethylene plastic film over this undercoating, which acts as a bond.

Pipeline companies are intrigued with the ease of application of polyethylene tape and its corrosion-resistant properties.

The manager of the pipeline division of a major oil company feels that use of the tape on both large- and small-diameter pipe will increase because it is so simple to apply.

"The material itself is more expensive than conventional coating," he notes, "but because of its ease of appli ation, labor costs offset material costs."

Another pipeline authority believes the tape is still uneconomical for "big-inch transmission lines." but that it is applicable for lines up to 10 in.

One of the newest techniques employed against corrosion is the saturation of the soil surrounding a line with corrosion-inhibiting chemicals.

A company that has been testing such a chemical solution for several months on 2 mi. of pipe in the St. Louis area reports good—though inconclusive—results to date.

The company has not disclosed the formula of the solution.

Soil treatment involved opening a ditch to within one foot of the 6-in. line and then soaking the backfill with the solution.

The amount of chemical applied cost less than $3,000.

A spokesman says he believes solutions could be formulated for any type of soil.

Prevention of corrosion of tank bottoms with chemicals has also been attempted.

One such project was undertaken in the Chicago area. Ditches were dug around two crude storage tanks and a chemical solution was poured in, saturating the soil beneath the tanks. No results have been reported.

One major pipeline company sees a trend shaping up in the installation of satellite pump and compressor stations on pipelines.

The chief difference between a satellite control system and a remote control system is that in the former a station operates by itself—after initial instructions—while in the latter a station must be fed instructions periodically (PW—Jun.24'60,p98).

"An area of great importance is more and more use of local automatic control of pump stations," asserts a spokesman for the company.

Use of satellite control instead of remote control is "an economy step," he says, in that it eliminates the need for "an elaborate microwave system."

The spokesman believes local automatic operation of stations is feasible for any type of pipeline.

Research aimed at improving batch-detection equipment and methods for products pipelines is expected to get increased attention.

"One technological advancement that most firms will be working on is batch detection," a pipeline company spokesman says.

One technique of tracing interfaces now in use is to measure with sensitive instruments the dielectric constant of a line's contents. A change in the dielectric constant means that a different product has passed the detection point (PW—Oct.9'59,p84).

In addition to instruments, however, actual manual sampling of the contents of a products pipeline is still a common way of determining the location of products.

What's New / IN PIPELINES, TANKERS, STORAGE

The Federal Power Commission has approved the $150-million project of Colorado Interstate Gas Co. and El Paso Natural Gas Co. to supply 470-million cf/d of gas to the Los Angeles area.

The proposal calls for construction by Colorado Interstate of 155 mi. of pipeline from its line at Rock Springs, Wyo., to Provo, Utah, and for construction by El Paso of a 395-mi. line from that point to the California-Nevada border (PW—June24'60,p 98).

At the border, the gas will be sold to Southern California Gas Co. and Southern Counties Gas Co. of California, for resale to Southern California Edison Co.

FPC's authorization is conditioned on approval of marketing arrangements by the California Public Utilities Commission.

The new lines will also enable Colorado Interstate to boost deliveries to its Rocky Mountain customers.

•

Columbia Gulf Transmission Co. has sought permission from the Federal Power Commission to enlarge its pipeline system to increase its delivery capacity by 52-million cf/d.

Present capacity of the company's line, which runs from Rayne, La., to Catlettsburg, Ky., is 666-million cf/d.

The $15-million expansion would involve building 97 mi. of loops on the 841-mi. line in Louisiana, Mississippi, Tennessee, and Kentucky, plus the construction of 29 mi. of laterals in Louisiana.

Columbia Gulf, a subsidiary of Columbia Gas System, Inc., delivers gas to the other operating companies of Columbia Gas for distribution in seven states and the District of Columbia.

•

Westalta Products Pipe Line, Ltd., reportedly wants to build a line to move Canadian gas liquids to the Glacier Pipe Line System now being constructed from Cut Bank, Mont., to Byron, Wyo., for crude movement (PW—Oct.21'60,p87).

This makes the second Canadian company seeking to use the Glacier line as an outlet to U.S. markets for LP-gas.

The first company to apply to the Alberta government for authority to construct such a line was Hudson Bay Oil & Gas Co., Ltd. Its line would run from the Pincher Creek-Waterton area to the border, near Carway, where it would be connected to other pipeline facilities linking it with the Glacier line.

The Westalta line would also extend from Pincher Creek to near Carway.

Hudson Bay's 8⅝-in. line would have a capacity of 31,000 b/d.

Westalta's line would be the same diameter, but its proposed capacity has not been disclosed.

•

Idemitsu Kosan, Japanese oil company, will order two 130,000-ton tankers from Japanese shipbuilders.

The tankers—believed to be the biggest ever built—are expected to cost a total of $14.5-million.

Delivery is scheduled for 1962 and 1963.

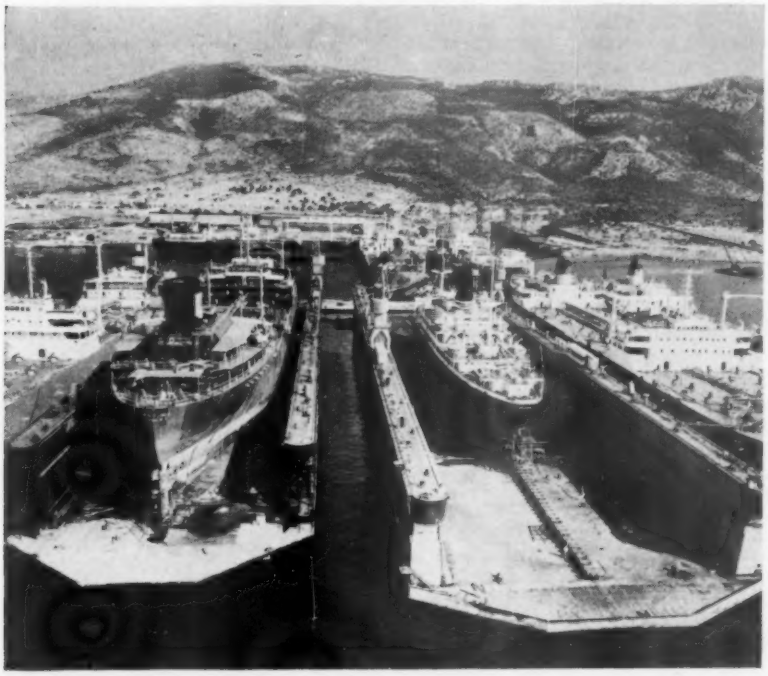
•

Expansion projects completed by Peoples Gas Light & Coke Co. last year boosted its maximum-day natural gas delivery capacity by 260-million cu.ft.—to 2,890,000,000 cu. ft.

Of this increase, 185-million cf/d were added by new pipeline construction by two Peoples Gas affiliates (PW—Apr.29'60,p50).

The remainder is accounted for by a hike in the withdrawal rate from underground storage of 75-million cf/d.

The company says gross capital expenditures last year were $99-million, compared with $39-million in 1959. Plans this year call for addition of another 175-million cf/d to the capacity of the company's system.



Greek Yard Is Waystop for Suez Traffic

The drydocks at Hellenic Shipyards, near Athens, Greece, are used by ships of all kinds sailing eastern Mediterranean trade routes and the Suez Canal—but mostly by tankers. Hellenic—the world's newest major shipyard—is owned by Stavros Niarchos, Greek shipowner. Niarchos lists as a chief advantage to tanker owners using the yard the fact that a tanker returning to the Persian Gulf can 'gas-free' (usually a three-day process) en route, thereby eliminating the lost time that results from repairing at a yard at the point of cargo destination.

West Europe Energy Controls Proposed

(A report from PETROLEUM WEEK'S *Paris Bureau)*

PARIS—An emergency energy program that could considerably affect oil marketing in the Common Market countries will be presented to the Councils of Ministers of three European supranational bodies next week.

The program, agreed to by executive bodies of the Common Market, the Coal & Steel Community, and Euratom, will be submitted to the governing bodies of the three groups Jan. 10.

The High Authority of the Coal & Steel Community announced that the program was the result of a compromise between it and the Common Market. Differences between the two had prevented agreement in the past few months.

One measure could, among other things, require oil marketers to publish price schedules and adhere closely to them.

This condition is implied in the provision for the elimination of differences in competitive conditions between oil products and coal in the six-nation Common Market.

Coal producers are already obliged by the Coal & Steel Community treaty to publish such schedules and to refrain from price discrimination among customers.

It is expected here that the regulations affecting coal would be liberalized, while oil products would be submitted to some type of price publicity.

Another measure calls for the harmonization of the energy policies of the six Common Market countries.

This would require member countries to inform each other before commercial or supply agreements are negotiated with countries outside the community. Member nations would also be expected to keep each other informed about customs regulations regarding various fuels.

The program also calls for adoption of a safeguard clause permitting quick introduction of emergency energy measures if the market situation worsens.

The point at which these controls would go into effect is now being decided by the joint working group on energy of the three supranational bodies.

1960: Bleak Year for Venezuelan Oil

CARACAS—Venezuela's year-end look at its oil industry in 1960 produced a bleak if not unexpected picture: Almost everything was down, except for a slight gain in crude production, which had increased an average of 7.9% annually in the previous decade.

The crude output gain for the year will apparently wind up at even less than the 3% anticipated in recent weeks. Through Dec. 21, the increase over 1959 had dropped to only 2.72%, according to the Oil Ministry, though at one point it had neared the 4% predicted early last year.

This increase was partly offset by loss of some markets, though sales to Canada—Venezuela's second-biggest customer—increased by 6.3%, the Petroleum Industry Chamber estimated in a year-end review.

While final figures on exports were not yet available, the Chamber said that exports to the U.S.—Venezuela's principal market—showed little change.

It cited losses of sales in the 70,000 b/d Cuban market; in Brazil, which bought Middle Eastern as well as Russian crude; and in Argentina, where domestic production is being expanded.

In his own year-end review, Oil Minister Juan Perez Alfonzo said production would have gained 6% except for loss of the Cuban market— which he described as a political event "which could not have been avoided by any price offer we could have made."

Venezuela's dollar income from oil—and the oil industry's new investment in Venezuela—both dropped sharply in 1960.

Indications are that oil company investments declined 20% from 1959, according to the Petroleum Industry Chamber.

And the Oil Minister announced that the country's estimated dollar income from oil in 1960 will drop to $1,158,000,000 from the 1959 peak of $1,357,000,000. These figures represent dollars sold to the Central Bank by oil companies to cover tax payments, as well as operating expenditures within Venezuela.

Here's How Venezuela's Drilling Has Dropped

Year	Total Wells Drilled
1954	836
1955	1,163
1956	1,449
1957	1,746
1958	1,195
1959	707
1960	410*

**Partly estimated by the Petroleum Industry Chamber.*

Drilling activity, too, fell off sharply in 1960 for the third straight year, to less than 25% of the 1957 peak level (table).

The Petroleum Industry Chamber estimated that the number of wells drilled in 1960 was off 42% from 1959—which, in turn, was 41% below 1958.

Surface exploratory activity dropped to 44.5 crew-months in 1960, from 159.4 in 1959, the chamber estimated.

The last geophysical crew was laid off in June, and at yearend there were only two geological parties working in the field.

Surface exploration in 1960, in fact, was only 10% of the average level for the preceding eight years, while exploratory drilling in 1960 fell to about one-third of the average for the same period.

Acreage still held under concession dropped in 1960 to the lowest point in 25 years.

Oil company turn-backs cut the total from 14,212,000 acres held at the end of 1959 to 11,732,000 as of Dec. 20, according to the Oil Minister, and to an estimated 11,567,500 acres at year-end, according to the Petroleum Industry Chamber.

Meanwhile, the Oil Minister has appointed a board for the new state Venezuelan Petroleum Corp., in a

move seen as preparatory for next week's meeting in Caracas of OPEC, the Organization of Petroleum Exporting Countries.

The company actually was set up last April, and the Venezuelan delegation submitted a report on it at the Arab League's Oil Congress in Beirut in October.

Up to now, however, it has existed only on paper, though a total of $1.5-million has been appropriated for it in national budgets for the last two fiscal years.

The appointment of a board of directors, Caracas observers point out, provides at least a skeleton organization to show to the OPEC delegates from Saudi Arabia, Iran, Iraq, and Kuwait.

The six directors appointed include three petroleum engineers and representatives of the two parties in the government coalition.

The petroleum engineers, none of them currently working as such, are all former Creole Petroleum Corp. employees. They are Humberto Penaloza, a former economy director in the Oil Ministry, and Carlos Rojas Davila and Manuel Iribarren Borges, both engaged in private activities in recent years.

Political parties are represented by Godofredo Gonzalez, congressman, national vice-president of the Social Christian Copei party, and a lawyer specializing in mineral law; and economist Pedro Miguel Pareles, congressman for the Democratic Action party, and president of the Permanent Congressional Committee on Mines & Hydrocarbons.

The sixth director is Luis Wannoni Lander, a sanitary and hydraulic engineer, and former president of the National Institute of Sanitary Works, a government agency.

Under the national corporation's statutes, the Oil Minister or his representative heads the board.

The new board of directors immediately announced its appointment of a four-member executive board, headed by Carlos Rojas Davila as General Director.

In this position, Rojas becomes the company's chief executive officer in direct charge of operations. He also continues as a member of the board of directors.

The other three members of the executive board are Angel Felix Bravo, a director of the Venezuelan Oilworkers Federation (Fedepetrol); Jose Luis Padron, a reservoir geologist in the Oil Ministry; and Jose Gil Yepez, a geologist and petroleum engineer, currently chief of the Oil Ministry's Dept. of Development.

Activation of the national oil company comes as the debate warms up on Venezuelan oil policy, following the National Economy Council's recommendation for revision (PW—Dec. 23'60,p13).

Besides the nearness of the OPEC conference, Caracas observers believe that Perez Alfonzo has been under pressure to get the national company off the ground because of the controversy touched off by the Economy Council's highly critical report (PW—Dec.30'60,p50).

The minister, commenting on the report recently, said that "a democratic government has many clashes with its consultative bodies."

Several business organizations have sided with the Economy Council in calling for an oil policy revision.

Directors of the Federation of Chambers of Commerce & Industry, for example, have slated a meeting with Perez to discuss oil policy.

And in the meantime, the Caracas newspaper "La Esfera" suggested, in a front-page editorial, that Perez be sent to the Middle East as ambassador.

Support lining up behind the Oil Minister on his oil policy includes his own Democratc Action party, labor organizations, and—ironically—the Communist and Revolutionary Leftist parties, which formerly criticized Perez and pooh-poohed the Baghdad agreement to form OPEC.

Conspicuously absent so far is an official oil policy comment from Copei, the other member of the two-party coalition government. A National director of the party did, however, raise doubts about present policy in a series of signed articles.

$70-Million U.S. Bid Wins Argentine Petrochemical Stake

BUENOS AIRES—A two-year contest between two U.S. groups seeking to set up a petrochemical complex in Argentina has been won by a five-company group headed by Fish International Corp.

Participating with Fish are Continental Oil Co., Cities Service Co., U.S. Rubber Co., and Witco Chemical Co.

The Argentine government has now provisionally accepted the plans that this group presented last fall for construction of a complete complex involving an investment of over $70-million.

It will be built in 1961 at San Lorenzo, about 350 mi. north of Buenos Aires, on the Parana River, to produce synthetic rubber, carbon black, and a series of other vitally needed allied products that Argentina currently imports (PW—Sep. 2'60,p12).

By agreement between the government and the company, a competing but smaller-scale proposal from Texas Butadiene & Chemical International has been canceled.

Texas Butadiene had proposed a $55-million complex at Puerto Deseado in southern Argentina to be built in two stages. The government had approved the plans and given a final go-ahead in October. Near the end of December, however, the company announced that it was withdrawing the plan for "economic, financial, and technical reasons."

The financing is one reason why the Fish group's bid has come out on top.

Excluding sums for civil works that will be paid by the provincial government, the U.S. companies' investment will total about $68-million.

Of this, 75% will be financed by Continental, Cities Service, and U.S. Rubber.

The remaining 25% will be split more or less equally between Fish Engineering, of Houston, and Witco Chemical.

Texas Butadiene, on the other hand had encountered difficulties in meeting the government's financing conditions, and was refused a time extension to resolve them.

The proposed location of the Fish group's installations was another attractive feature of the bid.

For one thing, San Lorenzo is in the heart of a highly industrialized area. Further, it is close to abundant supplies of raw materials, especially fuel, since it is at the southern end of a major gas pipeline from Campo Duran that was built by another U.S. group headed by Fish (PW—Oct. 16'59,p56).

Texas Butadiene, however, could not be guaranteed sufficient supplies at Puerto Deseado for some time, by either the federal or provincial governments.

The Fish group's plan was also favored by the government because it does not call for imports of butadiene, thus saving badly needed foreign exchange.

What's New / AROUND THE WORLD

JAPAN—Imports of Russian oil may be increased to 1.7-million tons in the fiscal year starting in April, from an estimated 1-million tons for the current fiscal year.

The new target—which would account for about 6% of Japan's total estimated oil imports for the 12-month period—was set in a pact signed in Moscow last week under a five-year trade agreement that started in 1959.

•

INDONESIA—The first Japanese oil field equipment is expected soon for the North Sumatra fields being developed with Japanese aid by the Indonesian government's Permina. Japan's North Sumatra Oil Development Co., which will be repaid in oil, shipped $470,000 worth of development equipment from Japan last week, and will ship another $1-million worth this month.

•

ARGENTINA—Pan American International reports it has opened three new producing areas as a result of exploratory activity on its contract acreage, where it also has been drilling development wells.

To date, Pan American has completed 250 wells in Argentina—100 more than it was committed to drill in the first two years of its 1958 pact with YPF, the state oil agency. It is currently delivering about 30,000 b/d of crude to a YPF marine terminal on the coast.

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UNITED KINGDOM—Esso Petroleum has applied for oil and gas prospecting licenses for four southern English counties—Surrey, Sussex, Kent, and Hampshire.

In a previous exploration effort, from 1937 to 1947, the firm drilled 16 holes. It discovered the Midlothian Field in Scotland, near Edinburgh, from which two wells are still producing small quantities of oil.

•

JAPAN—The Japanese independent that now charters the world's biggest tanker has ordered two bigger ones built for its own account. The vessels, each 130,000 tons, will be delivered to Idemitsu Kosan in 1962 and 1963 by two Japanese shipbuilders. Like the 105,000-ton "Universe Daphne" which Idemitsu now charters from National Bulk Carriers, the vessels will be used to transport Middle East crude to Japan, and products to America.

•

ARGENTINA—The government itself, and not YPF, its oil agency, will negotiate export sales of surplus gasoline and fuel oil that Argentina expects to have this year. According to reports from Buenos Aires last week, the Foreign Office is taking charge of talks with Brazil and will also approach other neighboring governments.

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SAUDI ARABIA—Export production capacity of the 27-gravity Safaniya field will be boosted to 240,000 b/d by next July, from a current 215,000 b/d, by a $2.8-million construction program Aramco is starting. It involves installation of additional pipelines and another pump. Due to increasing demand for the offshore field's heavy crude, output was boosted from a 76,000 b/d average in 1959 to something over 100,000 b/d in 1960.

•

TURKEY—Mobil, after drilling two successful wells on its Bulgurdag structure, has abandoned the third test at 5,738 ft.

The No. 3 Bulgurdag was ½ mi. northwest of the 1,200 b/d No. 1 discovery well. The second producer on the structure, which tested at 1,600 b/d, is ½ mi. south-southeast of the discovery.

•

GHANA—Russia will give technical and economic aid to Ghana on oil exploration, embassy sources representing Ghana in Madrid, Spain, said last week. The aid was pledged under the new $160-million economic aid treaty between the two countries.

•

ALGERIA—A Sahara wildcat in which Phillips has a 25% interest has been tested at the rate of 13.5-million cf/d of gas from three zones between 8,157 and 8,388 ft. The well, No. 1 Nezla, is in the Hassi Touareg permit, on which the French firm Copefa, holder of a 37½% interest, is operator. The other partner is the French company Omnirex, with 37½%.

French Producers Get More Outlets

PARIS—French semigovernment producers, following up last year's acquisition of Caltex properties, will increase their marketing outlets through a deal with a French independent distributor.

Union Generale des Petroles, representing six government-controlled production companies, and La Mure, a private oil and coal distributor, have signed a preliminary agreement setting up a joint affiliate to take over the latter's oil distribution network. UGP and La Mure will each hold a 50% interest in the joint company, under terms of the preliminary agreement.

UGP purchased a 60% interest in the Caltex refinery, and its transport and distribution networks. Caltex retained a 40% interest in the joint company set up to handle its French interests.

Two Sahara producers, S. N. Repal and Regie Autonome des Petroles, each hold one-third interests in UGP. The remaining third is held by a group of four other French and French-community producers.

The new agreement would provide an additional 400 service stations, besides an extensive network for the sale of fuel oil and other products made from French crude.

Most of La Mure's stations are located in southeastern France. Since Caltex stations are mainly in western France and the Paris area, the agreement will give UGP wider geographical distribution.

The semigovernment firms already hold about 2½% of the French metropolitan market, through the Caltex agreement.

Last year, La Mure supplied about 1% of the French gasoline market; 3.4% of the gas oil market; 3.04% of the home heating fuel; 2.52% of the light fuel, and almost 1% of the heavy fuel.

It has, in the past, been supplied with product mainly by the Cie. Francaise des Petroles.

ADVERTISING TO OVERSEAS MARKETS?

PETROLEUM WEEK now offers a split run . . .

Here's a new service designed for advertisers with something special to tell the overseas petroleum industry. In the same edition of Petroleum Week, we can print one ad to reach 41,000 U.S. and Canadian readers . . . and another ad specifically designed for Petroleum Week's almost 6,000 circulation outside the U.S. and Canada.

To take advantage of this split-run service, have your agency prepare two separate ads. We'll take it from there. The cost is just $150 above the earned rate, and is available for all positions except covers.

Foreign oil operations are becoming increasingly important. Sell this growing market directly through Petroleum Week's new split-run editions.

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

330 WEST 42 STREET, NEW YORK 36, N. Y.

ABC ABP OIL'S MOST READABLE MAGAZINE

Propane Gets Plug as a Fuel for Buses

Propane received a strong recommendation recently as a fuel for buses in a study completed for the Chicago Transit Authority by a business advisory firm.

After an exhaustive analysis of both diesel buses and propane buses, CTA was advised to "continue to purchase propane buses for the major part of fleet requirements."

The near-term price outlook for propane served to make it an attractive fuel.

Over the next five years or so, propane is expected to weaken in price, the CTA report showed, while diesel fuel "can be expected to stiffen somewhat."

This price comparison of the two fuels should be of interest to oil marketers because it demonstrates the thinking that may become predominant in consumer circles.

For example, the report discounts the present overcapacity in refinery operations and looks to an improvement in refinery margins as demand catches up with supply. This coupled with the "rigid growth in demand" for jet fuel could tend to lift the near-term price of diesel fuel.

Propane prices, on the other hand, may be depressed as a result of "growing competition between new suppliers of the LP-gas," CTA was told in the report.

Over the long term, however, CTA looks for a reversal in the relative price trends of diesel fuel and propane.

An important factor in the long-term outlook for diesel demand is the anticipated change in the present tax ruling, which favors kerosine-based jet fuel over the gasoline-based variety.

CTA learned that such a change would lessen commercial demand for kerosine-based jet fuel, thus relieving demand for other kerosine fuels.

But more important than fuel prices apparently is the favorable maintenance and operating characteristics of propane buses.

Propane buses, though difficult and costly to maintain when first put into service, have demonstrated substantial technological improvement over the years, CTA found.

Furthermore, "the history of engine changes for the propane-powered buses," the report continues, "illustrates that the propane-fueled engine is an inherently longer-lived engine than the diesel."

Although these economic factors would override any qualitative comparisons of noise and exhaust, the Chicago Transit Authority was nevertheless told that its propane buses "are noticeably quieter and produce less objectionable visible exhaust product than comparable diesel series of buses."

In the future, CTA will scrutinize new power plant developments, with particular attention to be given to fuel cells.

The Chicago transportation agency was advised that fuel cells (which convert fuel directly into electrical energy) are "perhaps the most significant" of the many projects affecting transportation.

"Electricity from one source or another is likely to provide the optimum means of power in the not too distant future," the CTA report noted.

The report also called attention to gas turbine engines, and the efforts of design engineers to make them competitive with the diesel engine.

"Radical changes in power plants suitable for use in CTA's buses," the report concluded, however, "do not appear probable within the next five years."

THIS "PRESTIGE" STATION, opened recently in Montreal, helps to show how . . .

BP Canada Earns Higher Status

BP Canada Ltd. is rolling ahead with its market expansion program. This month it plans to open its 800th station, 200 more than a year ago (PW—Feb.5'60,p50).

With its latest surge, BP earns new prestige in the Canadian market. This relatively young company (BP began marketing 3½ years ago) now ranks with those more venerable suppliers that count between 700 and 800 stations in the Dominion.

These include Anglo American Exploration, Ltd., Champlain Oil Products, Ltd., Cities Service Oil Co., Ltd., and Sun Oil Co., Ltd.

BP has concentrated its service stations in Ontario and Quebec in an attempt to gain 10% of the market there. As of Dec. 31, 1960, BP had opened 499 outlets in Quebec and 284 in Ontario, for a total of 783 (17 more are planned to be opened this month).

Until recently, the largest proportion (42.4%) of these outlets was dealer-owned. But a concerted building and purchasing program has pushed the proportion of company-operated stations to 42.9% (of which 24.9% were company-built and 18.0% were purchased).

The remaining 14.7% are leased by BP from others.

Most of BP's stations (95%) are conventional outlets. But where local characteristics and codes encourage it, BP has opened "prestige" outlets (picture).

Shell Ads Are Out—An Anticlimax

No oil advertising campaign ever generated so much comment—before it even started. Now that it has begun competitors can't find much to talk about.

The first Shell Oil Co. newspaper ads appeared last week—coming as somewhat of a letdown to all the uproar that had preceded them.

For many weeks, marketers in and out of the oil industry had looked with anticipation for Shell's new campaign. Rumors of what the ads would be like dominated gossip in advertising circles, while people in the know at Shell scurried to dodge the barrage of inquiries they received.

Among the events that sparked interest in the campaign were:

- The news that Shell would drop its "Cars Love Shell" theme for a more technical approach (PW—Dec.9'60,p42).
- The announcement by Shell and its new agency—Ogilvy, Benson & Mather—that practically all (90%) of the product advertising budget would be concentrated in newspapers.

So intense has been the demand for more news on these points that the agency has assigned an assistant to the president to handle press queries. "We've never seen anything like it," the agency remarks.

The first ads are just what most oil marketers had come to expect: A detailed, technical analysis of Shell's gasoline.

Taking full pages in dozens of newspapers across the country, Shell leads the consumer step-by-step through a short course in petroleum technology.

The first step is that Shell is now offering cresyl-diphenyl-phosphate, which, Shell explains, is "a new, improved version of TCP."

The rest of the ad deals with knock control, cold-weather warm-ups, and other aspects of performance. Over-all, ad managers with whom PETROLEUM WEEK talked last week had little to say about this approach.

"It's about what I had expected," was the typical comment.

"I wish them all the luck in the world," said another ad manager, who, like most, confessed that he would have to wait to see the results before he'd be convinced about the merits of a technical approach to oil advertising.

Perhaps the only surprise in the new Shell ads is the emphasis given to premium gasoline.

Shell is apparently trying to sell the motorist Super Shell gasoline, at a time when some marketers have switched over to a stress on their regular grade.

It's much too soon, of course, to judge whether or not Shell's tack will have any influence on competitive advertising. But most ad managers will have a hard time pushing for a more technical approach to oil advertising—without seeming to have taken their cue from Shell's campaign.

What's New / IN MARKETING

New "normal" degree-day figures are being calculated by the U.S. Weather Bureau, but it will be some time before they're released—maybe not before next January.

The normals form the basis of comparison for present temperature readings. (For example, the recent cold snap pushed the nation's average degree days to 1,724, compared to a normal of 1,659).

The normal figures are based on temperature readings between 1921 and 1950. The new normals will cover 1931 to 1960 This should please some oil marketers who believe that the weather in the past 10 years has been warmer than normal.

But actually there will probably be very little change in the normal degree days, says Dr. H. E. Landsberg, director of climatology at the U.S. Weather Bureau. "It may be a little warmer in the Northeast," he allows, "but not much."

The reason for the delay in releasing the new normal figures is attributed to the difficulty in calculating figures for the whole nation. "We could release some areas ahead of time, but we'd rather release them all uniformly," says Landsberg.

•

The "one-roof" organization that oil heat marketers are anxious to launch moved closer to its final countdown last week: A 12-man organizational committee approved its constitution and by-laws.

Although this spearheading group made "minor changes" in the proposed foundation of the organization, it will still retain its functional alignment and its basic chain of command (PW—Nov.20'59,p45).

Sometime this month it is hoped that the National Fueloil Council and the Oil Heat Institute of America will ratify the decisions of the organizational committee.

•

The House Small Business Committee frankly admitted last week that Rep. James Roosevelt (D., Calif.) had not yet proved his case for TBA divorcement.

In a 66-page report, the committee confessed that "it has not had either the time or resources to resolve adequately the conflictions appearing in the testimony" of Roosevelt's TBA hearings.

Roosevelt, however, was given a chance to repeat his charges against major oil companies. In the report, he said the majors impose restrictions on their dealers through their power to cancel leases.

But Rep. William Avery (R., Kan.) in his part of the report, discounted the importance of major oil company power. He called it an illusion of total size, which is not as important as relative strength in particular markets. Furthermore, he felt that company pressure on dealers was mainly the result of overzealousness in salesmen—who overstepped intended policy.

Roosevelt will still have an opportunity to prove his case. The House committee said in its report that the TBA investigations should continue until a decision can be reached.

J. Getgood M. W. Conn

JOHN GETGOOD has been elected president, chief executive officer, and a director of Pacific Petroleums, Ltd., Calgary, and **M. W. CONN** succeeds him as manager, sales and development division, of Phillips Petroleum Co.'s international department in New York. Conn was formerly assistant manager of the division for Phillips. Phillips and Sunray Mid-Continent Oil Co., both with part interests in Pacific Petroleums, have recently arranged an exchange of their Canadian properties for common shares in the company. In his new position, Getgood succeeds **George L. McMahon,** who becomes vice-chairman of the Canadian company. New directors of Pacific Petroleums are: **Stanley Learned,** assistant to the president of Phillips; **John M. Houchin,** vice-president of Phillips; and **H. M. Harder,** senior vice-president of Sunray Mid-Continent.

JOHN E. TAYLOR, Shreveport, La., has been elected vice-president of Arkansas Industrial Pipeline Corp., and **Dave E. Sullenberger,** Shreveport, has been elected vice-president of Arkansas Louisiana Chemical Corp., both subsidiaries of Arkansas Louisiana Gas Co. **Robert E. Wellborn,** Anderson, Ind., has been elected a director of another subsidiary, Reynolds Gas Regulator Co.

O. L. POLSON has been appointed domestic purchasing supervisor for Gulf Oil Corp., with headquarters at Houston. He will be responsible to **K. E. Rotegard,** who has been named manager of Gulf's newly created domestic services department. Polson has been associate director of purchasing at the company's general offices in Pittsburgh. In his new position, he will guide Gulf's purchasing activities for the domestic operating departments which are now concentrated in Houston.

EDWIN O. BENNETT, Houston, consultant in petroleum engineering and geology, is the 1961 recipient of the Anthony F. Lucas Gold Medal given by the American Institute of Mining, Metallurgical & Petroleum Engineers. The award to Bennett is "for fostering the development of gas pressure maintenance in oil reservoirs; supervising the first field stabilization of high-gravity crude oil; and developing the technique of multiple-zone completion of wells: for his pioneering in the design of high-pressure gas cycling plants resulting in increased recovery of condensate from reservoirs." Bennett has been with E. O. Bennett & Associates, in Houston, since 1943, and before that was assistant general manager of Continental Oil Co.'s drilling and production department. He has been a recipient of the Hanlon award, given by the National Gasoline Assn. of America.

L. C. ADAMS moves up to manager of exploration for Pan American Petroleum Corp., with offices in Tulsa. He was formerly exploration superintendent for Pan Am's Rocky Mountain division, at Denver. In his new position, he succeeds **J. C. Johnston,** who has been appointed vice-president and division manager of the company's Texas-Louisiana Gulf Coast division, at Houston. Adams, who joined the company in 1948 as a junior computer at Houston, became district exploration superintendent of the Lake Charles (La.) district in 1955, and exploration superintendent of the Rocky Mountain division in 1958.

R. W. Haigh L. C. Adams

ROBERT WILLIAM HAIGH, financial vice-president of Helmerich & Payne, Inc., Tulsa, will join Standard Oil Co. (Ohio), in February as director of planning, a newly created position. He will work with **Charles E. Spahr,** president of Sohio, and other company officers in coordinating growth planning. He joined Helmerich & Payne as assistant to the president in 1956.

DANIEL R. TOLL has been elected vice-president of Helmerich & Payne, Inc., Tulsa. Toll has served the company most recently as assistant to the president, manager of exploration, and chairman of the executive committee of Engineering-Construction Co., a pipeline contracting subsidiary. As vice-president, Toll will assume additional responsibility in the company's financial affairs.

J. HAROLD PERRINE is Sun Oil Co.'s new director of industrial relations, with offices in Philadelphia. Perrine was formerly assistant director; he succeeds William E. Zimmerman, who has retired. John H. Ashenfelter, now an assistant to the director of industrial relations, will succeed Perrine as assistant director.

DR. T. J. O'DONNELL, formerly director of the geophysical research division of Gulf Research & Development Co., Harmarville, Pa., has been named associate director of research for the company. He will direct all activities of the exploration research department, which includes the geophysical research division, the geology and geochemistry division, and the instrument development division. O'Donnell has been with Gulf Research & Development since 1933.

T. J. O'Donnell H. K. Sutherland

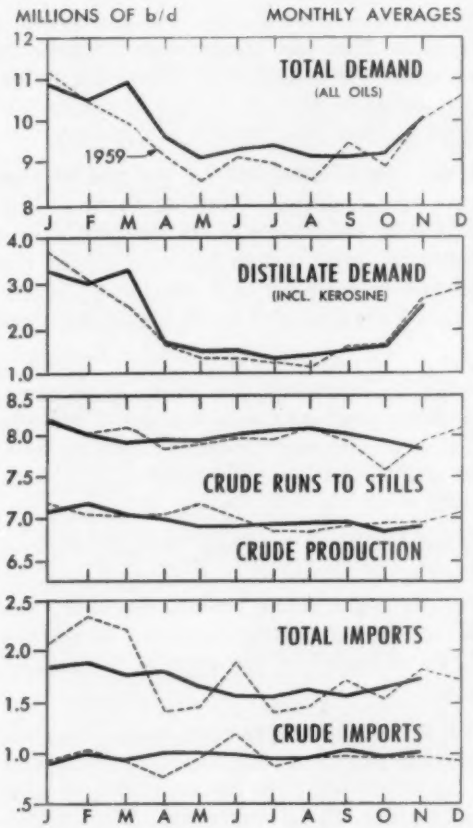
HARRY K. SUTHERLAND is the new superintendent of Shell Oil Co.'s Wilmington-Dominguez (Calif.) refinery, succeeding **J. B. St. Clair,** who becomes superintendent of the company's Houston refinery. St. Clair, who joined Shell in 1940, became superintendent of the Wilmington-Dominguez refinery in 1958. Sutherland, who was most recently chief technologist at Shell's Wood River (Ill.) refinery, joined the company in 1938.

EDWIN R. SMITH, formerly executive vice-president of the Oklahoma-Pate division of Humble Oil & Refining Co., has joined the company's headquarters staff in Houston. He will serve as assistant to **D. W. Ramsey, Jr.,** Humble's vice-president and director of marketing. Smith joined the Standard Oil Co. N.J. organization in 1929 as a district marketing clerk for Esso Standard Oil Co. He transferred to Carter Oil Co. in 1949 as general manager of marketing in the Denver office, and moved to the parent company in 1953 as manager of the market development division. In 1956 he became executive vice-president of Oklahoma Oil Co. and Pate Oil Co. He continued to hold these positions after the two companies became the Oklahoma-Pate division of the new Humble Oil & Refining Co.

EDWARD P. KEELER has been promoted to staff proration engineer for the Houston exploration and producing division of Mobil Oil Co. In his new position, he will serve as a consultant to the division engineering manager and to Houston operating personnel on matters related to regulatory bodies engaged in the conservation of oil and gas. Keeler, who joined Mobil in 1947, was most recently production engineer at the Lafayette (La.) producing district.

PETROLEUM WEEK'S

Fingertip Figures



Figures for period ended Dec. 30, except as noted

TOTAL DEMAND

Latest 4-week average	*
Year ago	10.519

DISTILLATE DEMAND

Latest 4-week average	*
Year ago	2.895

RUNS TO STILLS

Latest week	*
Previous week	8.009
Year ago	8.369

CRUDE PRODUCTION

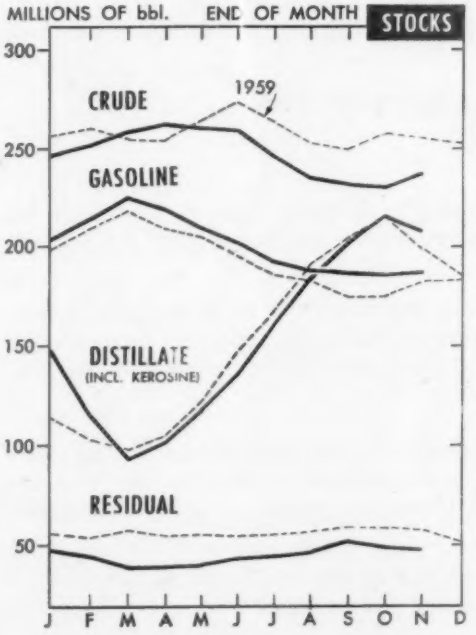
Latest week	*
Previous week	7.139
Year ago	7.068

TOTAL IMPORTS

Latest week	*
Previous week	1.825
Year ago	1.662

CRUDE IMPORTS

Latest week	*
Previous week	.974
Year ago	.906



CRUDE STOCKS

Week-ended Dec. 24	236.9
Previous week	236.9
Year ago	255.5

GASOLINE

Latest week	*
Previous week	191.3
Year ago	189.0

DISTILLATES

Latest week	*
Previous week	183.1
Year ago	175.6

RESIDUAL

Latest week	*
Previous week	47.2
Year ago	49.9

Estimates are that crude runs to stills will take a 3% jump this month over December.

The Bureau of Mines forecasts that crude processed through the nation's refineries in January will average 8,250,000 b/d, or approximately 250,000 b/d more than last month's throughput.

This is just a hair's edge higher—0.2%—than the 8,230,000 b/d run last January.

The higher runs are justified by the brisk demand for distillates so far this heating season, and the resultant drain on burning-oil stocks.

Distillates inventories, which fell as much as 11-million bbl. in one week during the December cold snap, will probably begin the year in better shape than in 1960.

One sour note could be an increase in the rate of buildup of gasoline stocks as more crude is processed.

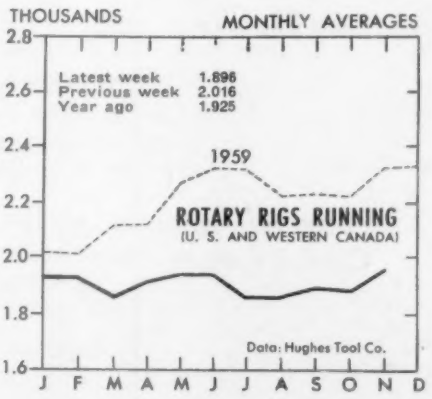
Gasoline stocks closed the year at more than 193-million bbl. Motor fuel inventories are high in comparison to last year, when refiners were faced with a product glut throughout the gasoline demand off-season.

Current forecasts show that refinery runs may continue at close to 8.2-million b/d for most of the first quarter.

That rate would be 1.4% higher than the first quarter of 1960. Total demand during the first quarter is also expected to increase 1.4% from the like period of 1960.

* * *

*Due to the New Year holiday, most figures for the week ended Dec. 29 were unavailable at press time.



The Market Trend

Don't Faint, But Here's a Buyer for You

We're digging up a hot buyer for you, and don't say that's not a favor in today's market for foreign oil. He's solvent. Furthermore, he wants 18-million bbl. of crude oil.

We'll bet you $5 you didn't know that the Manguinhos refinery in Rio is looking for 10,000 b/d of crude for a five-year period beginning in 1963. The reason the bids were called so soon is that a Brazilian law requires a two-year registry period for five-year supply contracts.

So all you have to do is submit the winning bid by the end of this week. But be warned that you have real problems. First off, you'll be bidding right under the gun of the OPEC price-holding confab that starts Jan. 15 in Caracas. With oil producing governments increasingly in the price act, what will you do? Will you be a realist and incur the government's displeasure? Or will you be a Pollyanna and in all probability lose out on the business?

You have a problem in offering to supply oil two years in advance, for lots of changes can take place before you load the first cargo. What will the tanker market look like then? How much more oil will be found between now and 1963? On the other hand, will the nationalistic fever abroad work to shut off important supply areas?

Not the least problem is payments. Brazil has been very slow about coming up with cash—for the very good reason that it doesn't seem to have any. Dollar remittances are running months behind. Recently, the government's currency and credit regulating agency informed oil companies that its 120-day pay lag will be extended to 180 days in the future. The exchange position is desperate.

But the main problem is price, for oil companies have waited for cash before. Brazil recently has been buying 34-gravity Arabian crude at prices around $2.15 a bbl., delivered. Using USMC—50% as an ocean freight rate, this means a discount of about 60¢ a bbl. To be competitive, Venezuelan crude would have to sell about $1.80 a bbl., f.o.b., or about 75¢ off posted. Count on it—in Caracas next week at OPEC, this will be the same thing as anathema.

Anyway, don't say we didn't give you a prospect.

Argentina as An Exporter:

Governments increasingly are moving in on the oil domain. Last week the Argentine foreign office took over some of the files of YPF, the nation's oil agency.

In the future, the foreign office will deal directly with other South American governments to sell surplus products. In 1961 the foreign office expects to sell about 6-million bbl. of gasoline.

Uruguay Still On the Fence:

ANCAP, Uruguay's oil agency, apparently will keep prospective suppliers of crude oil on pins and needles for another month. Uruguay is in the market for 16,000 b/d for a three-year period, starting this month (PW—Dec.9'60,p48).

ANCAP was expected to announce the winner on Christmas day. Now, it appears, the awards will be handed down on Jan. 31.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of December 31

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....12.25-13.25
- Gasoline, 92 oct reg....11.25-11.5
- Kerosine....9.25-10
- Heating oil, No. 2....8.5-9
- Gas oil, 48-52, d.i....8.75-9.25
- Fuel oil, bunker "C"....$2.30-2.40

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....11
- **Gasoline, 87 oct research reg....9.875↓-10↓**
- **Gasoline, 80 oct research....9.125↓-9.25↓**
- **Gasoline, 70-72 oct motor method....9↓**
- **Kerosine....9.5↑**
- **Heating oil, No. 2....8.375↑**
- **Gas oil, 48-52 d.i....8.625↑**
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....10.4-10.65
- Heating oil, No. 2....9.4-9.65
- Fuel oil, No. 6....$2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg....12.5-13.25
- Kerosine....11-11.125
- Heating oil, No. 2....9.5-9.75
- Fuel oil, No. 6....$1.80-1.90

Chicago, bulk
- Gasoline, 92 oct reg....12.625
- Heating oil, No. 2....9.75-11.35
- Fuel oil, No. 6 high sulfur....7.65

Los Angeles, rack
- Gasoline, 88 oct reg....11-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.90
- Heavy fuel, PS 400....$2.05-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....4.5-5
- Propane, Baton Rouge....5.625

Pennsylvania Lubes
- Bright stock, 25 p.t....25
- 200 vis. neutral, 25 p.t....28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200-210 vis....23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200 vis....23-24

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130....15.5
- Gasoline, 79 oct research....9
- Kerosine....9.625
- Gas oil, 48 d.i. minimum....9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.Kan.), 36.0-36.9....$2.69-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....3.00-3.05
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.33†
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.425
- Virden (Man.)....2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, La Salina....1.85
- Lagomar, 31-31.9, Cardon....2.55
- Lagunillas Heavy, flat, La Salina....2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.80
- Safaniya, 27.0-27.9, Ras Tanura....1.47
- Iran, 34.0-34.9, Bandar Mashur....1.78
- Iran, 34.0-34.9, Abadan....1.73
- Iraq, 35.0-35.9, Fao....1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.59
- Qatar, 41.0-41.9, Umm Said....1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud....1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud....1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud....1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon....$2.17
- Iraq, 36.0-36.9, Tripoli, Banias....2.21

North Africa, Phillipeville, Algeria
- Hassi Messaoud, 48 and above....Withdrawn

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean....(USMC+20%) $3.42
U.S. Gulf-New York, dirty....(USMC+7½%) $3.06
NWI-USNH, dirty....(USMC—7½%) $2.54
NWI-UK/Cont., dirty....(Scale—30%)22/11*
Per. Gulf-UK/Cont., dirty (Scale—25%) 42/11*↓
Persian Gulf-USNH, dirty....(USMC—42½%) $6.84

**Sterling*

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PETROLEUM WEEK REPRESENTATIVES

Atlanta 9 — R. H. Powell, 1375 Peachtree St., N.E., Trinity 5-0523

Boston 16 — David G. Sawyer, Copley Square, Congress 2-1160

Chicago 11 — Edward A. Callahan Jr., 520 N. Michigan Avenue, Mohawk 4-5800

Cleveland 15 — Marcus A. Loy, Jr., 55 Public Square, Superior 1-7000

Dallas 1 — James R. Pierce, 2100 Commerce Street, Riverside 7-9721

Denver 2 — J. W. Patten, Tower Bldg., 1700 Broadway, Alpine 5-2981

Houston 25 — D. O. Hanson, 724 Prudential Bldg., Jackson 6-1281

Los Angeles 17 — Peter S. Carberry, 1125 W. Sixth St., Huntley 2-5450

New York 36 — David G. Sawyer, 500 Fifth Ave., Oxford 5-5959

Philadelphia 6 — H. Sherman Davis, 6 Penn Center Plaza, Locust 8-4330

Pittsburgh 22 — Marcus A. Loy, Jr., 4 Gateway Center, Express 1-1314

Portland 4 — Scott Hubbard, Room 445, Pacific Bldg., Capital 3-5118

San Francisco 4 — William C. Woolston, 68 Post Street, Douglas 2-4600

Tulsa 3 — J. A. Hartley, 522 South Boston, Luther 7-5594

England, London E. C. 4 — E. E. Schirmer, McGraw-Hill Co., Ltd., 95 Farringdon St.

Germany, Frankfurt/Main — S. Kimes, 85 Westendstrasse

Switzerland, Geneva — M. R. Zeynel, 2 Place du Port

H. Wolpman

W. L. Connolly

HAROLD WOLPMAN has been promoted to senior vice-president of Grove Valve & Regulator Co., Oakland, Calif., and **WALTER L. CONNOLLY** moves up to vice-president-manufacturing. In his new position, Wolpman will be in charge of plant engineering, plant structures, and new plant locations. He joined Grove in 1937 and was most recently vice-president-plant engineering. Connolly moves to Oakland from Paris, where he was director general of Grove France, a subsidiary.

EUGENE L. McCARTHY has been elected vice-president in charge of product development and standards engineering for Black, Sivalls, & Bryson, Inc., with offices in Oklahoma City. McCarthy, who joined BS&B in 1949, has been manager of oilfield engineering for the past three years. In his new position, he will be responsible for product improvement and new product development for all product lines marketed through BS&B's central sales organization. At the same time, **Corliss V. Little** was elected vice-president in charge of glass fiber products for BS&B. The new product line, marketed under the trade name of Poxyglas, will be manufactured at the company's new production facility at Ardmore, Okla. Little joined BS&B in 1956 as director of industrial engineering. He has also been in the company's product planning and product development sections.

JOHN D. MITCHAM has been appointed plant sales engineer at the Gainesville (Tex.) plant of the National Supply Division of Armco Steel Corp. He will be responsible for sales and service of torque converters manufactured at Gainesville, and hydraulic couplings and other industrial products manufactured at Torrance, Calif. Mitcham, who joined National Supply in 1935, has been closely associated with its torque converter program since 1956.

ALAN REID is store manager, and **Bill Jones** assistant store manager at Franklin Supply Co.'s new outlet in Hennessey, Okla., which will serve the Kingfisher field. Reid, who joined the company two years ago as a trainee, has worked at Franklin stores in Denver, Odessa, and Oklahoma City. Jones joined Franklin six months ago as a trainee.

ROBERT E. MARSHALL, secretary and general counsel of Worthington Corp., Harrison, N.J., has also been elected treasurer. He succeeds **W. R. Shook**, who has resigned to become treasurer of Avon Products, Inc. At the same time, **C. Robert Maranville** was elected assistant treasurer. He has been manager of employee benefits for the company since 1958.

J. B. WALTERMIRE is the Lafayette (La.) representative for Gulf Coast Machine & Supply Co. Waltermire has had previous experience as a drilling superintendent in the Gulf Coast area.

VINCENT THOMAS is the new manager of sales for Petroleum Technologists, Inc., Dallas, and **Charles R. Betzel** is the new manager of laboratories. Both men were formerly technical representatives for the company in Dallas. Petroleum Technologists specializes in collecting and interpreting data on petroleum reservoirs, and products research applied to petroleum reservoir engineering.

V. Thomas

K. S. Bayless

KENNETH S. BAYLESS has been elected executive vice-president of Cal-Metal Pipe Corp. of Louisiana, Baton Rouge, La. In his new position, he succeeds **R. C. Stewart** who will return to California to resume a former association. Bayless was formerly vice-president, sales, for Cal-Metal.

HAL S. DAVIS has joined Packard Bell Computer, a division of Packard Bell Electronics, Los Angeles, as sales manager for components and systems. He will direct sales and applications engineering activities for the company's lines of digital components and systems. He was formerly marketing manager of the Datalab division of Consolidated Electrodynamics Corp.

EUGENE McCOY moves up to assistant manager of gas engine compressor sales for Cooper-Bessemer Corp., Mt. Vernon, Ohio. He was formerly a programming analyst for the company. He has been with Cooper-Bessemer full-time since 1954.

A. B. COLT has been appointed store manager for the Jones & Laughlin Supply Division at Carmi, Ill. Colt, who joined J&L in 1944 at Henderson, Ky., was store manager there prior to this new assignment.

BOLLING A. ABERCROMBIE has been promoted to manager of product planning for the Axelson-Garrett Division of U.S. Industries, Inc., with offices at Longview, Tex. He has served Axelson-Garrett and its predecessors since 1955 as sales engineer, administrative engineer, and, most recently, manager of product planning for the engineering department.

WILLIAM G. PERSONS is a new product sales representative for Universal Oil Products Co., serving the West Coast and Hawaii from offices in Downey, Calif. He was formerly associated with Tretolite Co., division of Petrolite Corp.

ALAN LAW is head of the new industrial engineering department of Graver Tank & Mfg. Co., division of Union Tank Car Co., in East Chicago, Ind. Law, whose new title is chief industrial engineer, will report to **Ivan Smith,** East Chicago plant manager. **E. G. Vail,** formerly located in Tulsa, succeeds Law as plant manager for Graver Tank in Houston. The new department will incorporate plant engineering with industrial engineering; the former come under the direction of **R. W. Briska,** who has been appointed plant engineer. His group will report directly to Law.

A. Law

H. F. Wiley

HAROLD F. WILEY, director of the analytical and control division of Consolidated Electrodynamics Corp., Pasadena, Calif., has been named vice-president. In his new position, Wiley continues to head the activities of the A&C division, and will report to **Robert H. Garretson,** executive vice-president. Wiley, who joined the company in 1937, became the first director of A&C division, which was formed in 1957.

C. L. VICKERS moves up to vice-president in charge of finance for Continental-Emsco Co., Dallas. Vickers, who was formerly C-E's treasurer and credit manager, succeeds **D. M. Bailey,** who has accepted the position of executive vice-president of Southern Union Gas Co., Dallas. **Will D. Crowell** succeeds Vickers as C-E's treasurer and credit manager. Crowell has been assistant treasurer and assistant credit manager. **Herbert P. Dawkins,** formerly an assistant manager, succeeds Crowell in both positions. **John F. Wagenhauser,** formerly an attorney in C-E's Dallas office, is now its general counsel.

C. L. Vickers

R. C. Dunlap, Jr.

ROBERT C. DUNLAP, JR., has been elected vice-president of Texas Instruments Inc., Dallas, succeeding **Fred J. Agnich,** who has resigned. Agnich, who plans to devote more time to his personal business interests, will remain in the employ of the company for a while, and will also continue as a director. In his new position, Dunlap will become operating head of the company's geosciences activities, and will continue as president of Geophysical Services Inc., TI's exploration subsidiary, a position he has held since 1959.

WILLIAM F. PLUME moves up to chief electrodyne engineer for the Hupp Aviation Division, Hupp Corp., in Chicago. Electrodyne valve operators manufactured by Hupp are electromechanical units used in the utility, petroleum, chemical, and process industries. Plume joined Hupp Aviation in 1959 as a project engineer. He has also been associated with Consolidated Machine Tool Co. and DeLaval Steam Turbine Co.

WILLIAM H. WHEELER has been named general sales manager of Worthington Corp.'s recently enlarged construction equipment division, at Holyoke, Mass. The division is now responsible for the sale of construction equipment products, including portable compressors, air tools, mobile drilling rigs, and highway pavers, which were formerly handled by the resale sales department, marketing division, in Harrison, N. J. Wheeler was formerly manager of sales at Holyoke.

WILLIAM S. BARNUM is the new assistant manager of tubular sales for Kaiser Steel Corp., at Oakland, Calif. He succeeds **Jack H. Webber,** who recently became manager of the Mid-Continent sales district at Tulsa. Barnum was assistant manager of sheet and strip sales.

J. W. MOFFETT has been promoted to manager of chemical products sales for the Kaiser Refractories & Chemicals Division of Kaiser Aluminum & Chemical Corp., with offices at the eastern division general sales headquarters, in Pittsburgh.

JOSEPH L. STURDEVANT is the new manager of commercial sales for the Remington Rand Univac division, Sperry Rand Corp. He will be responsible for sales and service of the division's industry marketing group. Sturdevant, who joined the company in Los Angeles in 1949, was most recently assistant general sales manager for Univac in New York.

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SEARCHLIGHT SECTION

(Classified Advertising)

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Use this Classified Advertising Section for bringing business needs or opportunities to the attention of men associated in administrative, executive, management, sales and responsible technical engineering and operating capacities within the oil industry.

PETROLEUM WEEK

The Landis Plan: More Bureaucracy

FOR OUR TWO CENTS WORTH, there are some points in the Landis blueprint for Washington's regulatory agencies that we can't get enthused about, no matter how noble the objectives.

Few people will disagree that an overhauling of the regulatory muddle is long overdue, particularly the ponderous mechanism of the Federal Power Commission. And everyone, we're sure, concurs with the feeling of James M. Landis that policy coordination among the agencies is or should be of prime importance. That's one thing that has been lacking for a long time, and far too often the Federal government's right hand neither knew nor seemingly cared what the left was doing.

It strikes our mind, however, that the interjection of a new level of supervision, on a White House level, isn't going to help at all.

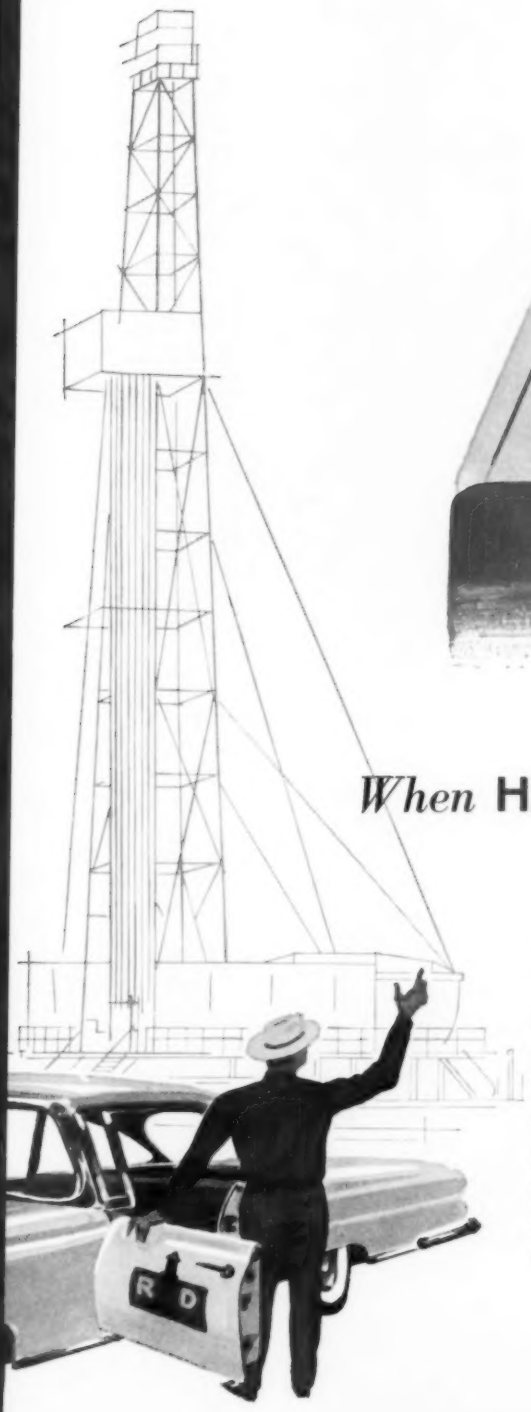
THIS ISN'T STREAMLINING. It's more bureaucracy—more government and more confusion, instead of less. Technically, the proposed offices and their inhabitants are merely coordinators and planners, but where is the line to be drawn? Who can feel sure that the czars who'll run the offices won't have more real power and authority than the men who'll have to do the actual regulating?

This raises another interesting facet. On the one hand, Landis charged that the quality of commission and board personnel had deteriorated because of presidential obligations and political patronage. He expressed belief that something should be done to upgrade the positions and prestige to attract high-caliber men. Yet is the government really going to get the kind of talent it wants and needs if candidates know beforehand that "big brother" will be riding herd on every move? And that they, in effect, will be minions, not masters?

Landis also proposed that the power and prestige of agency chairmen should be strengthened, and should include control over personnel appointments. Yet one of the new czars is given specific authority to oversee personnel matters. This can only lead to the old seesaw question of who's really running the store.

IN HIS COMMENTS ON FPC, Landis raised another disconcerting point. He recommended that future commissioners be men who are "qualified and dedicated . . . with the consumer interest at heart." It's all well and good to protect consumers, but how about the companies that are regulated by this agency? Are they to have no voice, no representation? Is it to be assumed that everything they do or propose is anticonsumer? Is there to be no balance?

Basically, though, Landis' report did bring the regulatory muddle out into the open. For that we're grateful. But for another layer of regulators to regulate the regulators, Heavens-to-Betsy, no! On that we'll stand.



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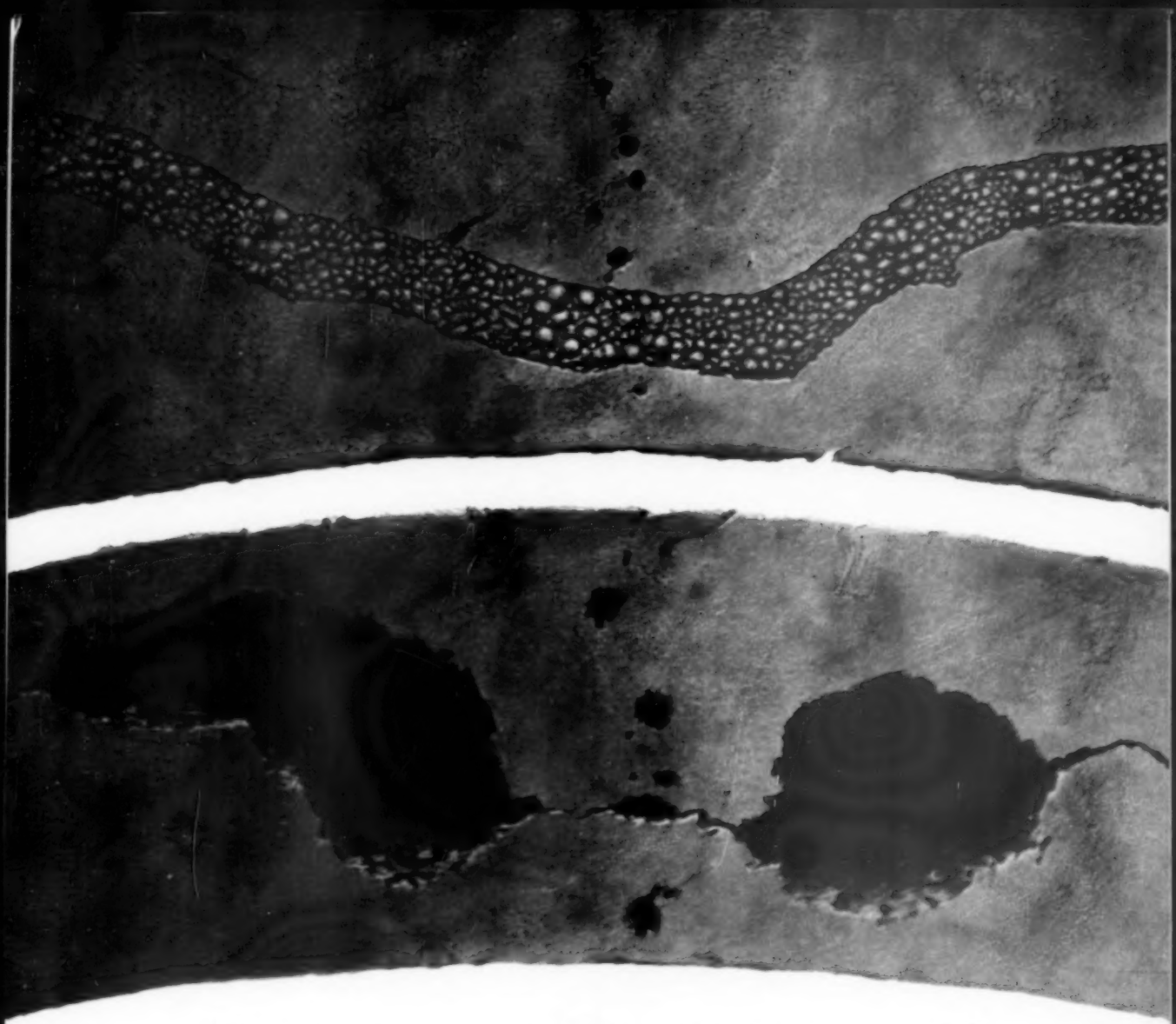

Which treatment makes the better well ?

These inside-the-well-bore views of enlarged sections of treated formation, as visualized by an engineer, compare two methods of stimulation.

The top illustration represents a sand-packed fracture after conventional fracturing. This type of treatment often gives good production increases at low cost. Many wells, however, do not respond profitably to these treatments. Small production increases, rapid production declines, or trouble with sand returns may limit profits.

The bottom illustration depicts the probable result of a new type of Dowell treatment. It uses slow-reacting Retarded Acid injected at a high rate to create open flow channels over a large drainage area. Since the etched formation supports itself, there is no need for using sand that might crush, imbed, or flow back with production. This new treatment technique is giving excellent production increases in many areas.

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